THE

Horticulturist,

AND

JOURNAL OF RURAL ART AND RURAL TASTE.

A Reform Needed.

THERE is one feature in the municipal government of most of our towns and villages, indicative of so low a point of civilization, that it calls loudly for reform. It would, perhaps, hardly be worth while to call attention to it, trusting to the progress of good government and propriety to banish it, did it not appear rather to take the position of a more established fact, year by year.

We refer to the custom of allowing animals that belong to the pasture-field, and barn-yard, to run at large in the highways of the country, and streets of the cities.

We believe we are correct in saying, that this abomination prevails by toleration all over the Union, with the exception of one single state, Massachusetts—which forms a most honorable exception.

The traveler may journey from one end of Massachusetts to the other—he may visit her smallest hamlets—her lovely, elm-embowered villages—her busy manufacturing towns, or her thriving and populous cities—and everywhere he sees more order, cleanliness, and good government, than elsewhere. If it pains us as a New-Yorker to be obliged to confess their superiority—it gives us pleasure as an American, to be able to point to one of the states where public education has been longest and most largely diffused, as a standard in these respects to other states that yet lag behind in these external marks of civilization.

We believe, indeed, that the same municipal laws governing the towns and villages of Massachusetts, which forbid the running at large of animals in the streets, are for the most part in existence in other parts of the country. But in Massachusetts these laws are enforced—in other states they are a dead letter.

The most flagrant violation of these laws, and the most unaccountable one, is in the great commercial metropolis of the country, New-York. In the third largest city of the christian world, where the wealth, luxury, and refinement of the oldest and most

cultivated portions of Europe prevail, the civilization is at so low an ebb in this respect, that hogs and cows have free range of the streets—that droves of fat cattle and sheep are driven through the streets at mid-day, and hardly a month passes by that the newspapers do not record accidents to women and children—gored or trampled upon in the very park in front of the city-hall itself. All over the country the condition of things is little or no better. In Washington, droves of cows and hogs, by hundreds, ramble at will over the open unimproved grounds about the city—in almost every town the traveler stumbles over swine at every corner of the street; in almost every country neighborhood, the owners of gardens and orchards tremble daily for the sanctity of their premises, and guard jealously the gates, lest the domestic animals that are nobody's property in particular, but live by robbing the community in general, should make an onslaught upon our light wooden fences, and sweep garden and orchard before them.

The extra cost of fencing against these commoners, amounts to at least hundreds of millions of dollars to the country at large—as any one who has traveled through France, where no animals run at large, and there are miles without fences, will understand. Every man who owns a few acres of land, spends hundreds of dollars in shutting out animals that are not his own, and have no right to be at large to his annoyance and cost; and thus the country is both disgraced and over-taxed by a miserable shortsightedness upon the part of the more intelligent members of the community, who will not boldly enforce the law and protect their own interests.

We have called this feature a mark of a low condition of civilization, and every thinking person who will give it a few moment's, reflection, will, we think, agree with us.

In Ireland, the poor cottagers think it no degradation to humanity to share the best and only room of their cabins, with their pigs. In Switzerland, even wealthy farmers lodge their cattle in the basement story of their houses, and a neatly rounded manure-heap is one of the scenic features that meets the eye from every front-door.

Will any American attempt to argue that this condition of things in Ireland and Switzerland, is not the index of a lower state of civilization than our own? But will not any person, either from England, France, or even Massachusetts, also feel equally shocked at the *brutal* aspect of the streets in most parts of the United States, and put it down as an almost equally decided mark of low civilization?

It seems to us that as there can be no question on this subject, and as no right-thinking man can wish to live among cattle or share the streets and avenues with them, it is time that something should be done to arouse public attention to the barbarism we speak of. It may be thought a little matter by many persons, but so are personal cleanliness, the health of cities, the introduction of pure water in towns, and even common schools—all "little matters" if the public sentiment and public intelligence are at so low an ebb as not to see and feel their value. But in fact everything which tends to make mankind respect themselves, tends to raise them in the scale of humanity. Certainly the more we live like men, the more we fulfil this condition, and it is no help to such a hopeful condition to pass great part of our time in

the streets of towns and cities when animals and men make common enjoyment of them.

There are two classes of citizens who stand in the way of wholesome reform in the matter we speak of. One, and the largest, is an ignorant and indifferent class—who see nothing uncomfortable in this state of things, and need therefore to be roused and shamed into action by an expression of right feeling on the part of those who see cleanliness and decorum in their true light; the second consists of demagogues who fear to disturb the prejudices of that small class in the community, which understand by the word liberty, not a wholesome obedience of just laws made by the people—but a certain license to do anything and everything not absolutely criminal, with their own property, and that of all their neighbors.

That it is only needful for a few good citizens in every town to look at the matter clearly, and determine to have orderly and sanitary laws like these enforced, we have had abundant proof in the town where we live—which is, so far as we know, the only one in the State of New-York where animals are not joint-stock possessors of all the streets and highways. Eight or ten years ago, Newburgh, which has a population of nine thousand inhabitants, was one of the least cleanly and orderly towns in the North. Droves of hogs, cows and geese ran at large everywhere, and the possessor of a garden or even of a bit of sidewalk was always liable, night and day, to the nuisance and annoyance of numbers of these commoners. At length it was determined by a few of the more orderly inhabitants, to endeavor to have enforced the law for pounding animals. The trustees of the village doubted the possibility of enforcing the law, and faltered in their duty. At the next election, however, the hog-law was made the test, trustees favorable to its execution were elected by a large majority, nothwithstanding a fierce opposition. When the law was enforced, so strong was the feeling of resistance, that the public pound was several times broken into at night, and the animals released. But the orderly part of the community stood firmly by the authorities, and the latter did their duty, until the law triumphed. After much grumbling on the part of many who imagined that they had a clear right to prey upon the public in this manner,a general acquiescence came about. And now for five years we have had cleanly streets, free from all animals of all kinds, and such an air of neatness and rural beauty has sprung up, that the place has almost changed its character. The carriage-gates of grounds, like our own, which, under the old system of things, needed almost an armed huntsman to keep out the brute population, are now wide open day and evening, without the least plant suffering depredation; and what is the best part of the story, so completely has the feeling of better civilization triumphed, that it would, we imagine, be very hard at the present moment, to persuade the population of this town to return to the old condition of streets, overrun with unclean beasts.

In order that the reform may spread, right-thinking persons must both protest and take up arms against the nuisance—and we hereby enter the lists with all our hearts, and call on our fellow citizens throughout the country to shake off this remnant of low civilization.

NOTES ON THE GRAPE.

BY WM. W. VALK, M. D., FLUSHING, LONG ISLAND.

Dear Sir—In your Horticulturist for September, page 410, I notice an article headed "The Isabella Grape—Its History, &c." You have some remarks appended thereto, a portion of which I quote, viz: "There is, unfortunately, no well authenticated proof that our native grape has ever been hybridised with the grapes of Europe. All our seedlings, so far proved, are chance seedlings—but we believe some of our pomologists are now busy with the experiment of crossing the species if possible—to effect a more speedy amelioration of the hardy native varieties. A cross between Black Hambugh and Isabella, giving us the size and luscious flavor of the former, and the hardiness of the latter, would be worth untold thousands."

I beg leave to refer you to Hovey's Magazine, Vov. IX, page 134. You will there find an article "*On the Production of hardy Seedling Grapes, by hybridizating the Native with the Foreign Grape.*" I communicated the same to that periodical, and should like to have you read it. You will perceive, that as far as human accuracy can be depended upon, I succeeded in fertilizing the Hamburgh with the pollen of the Isabella. In that year, (1845,) I raised fourteen seedlings from the fertilized seed. Absence, and other causes combined, compelled me to neglect them for more than two years, at the end of which time but *two* of them were living, and these not in very good order. All had been *carefully* labelled, and kept in pots. In the spring of 1847, I planted both these seedlings in the open soil, at the head of my garden, tacked them to the fence as they grew, and have rather *neglected* them than otherwise. I did not prepare the earth in any way for their support, nor have I given them the *slightest* protection *during the last four winters*. Last year they fruited for the *first* time—one vine having on it eleven bunches, the other thirteen. The fruit was of good size, and *very* handsome looking, but before it was ripe, the poultry fancied it, and soon destroyed the whole of it, much to my regret and annoyance, for I now began to watch my vines with more than ordinary interest. This season they have borne a little more, and on one vine the fruit was beautiful, on the other, (with a *western* exposure,) the mildew rather injured its appearance. During my absence for four days in Connecticut, some miserable thief got over my fence, and helped himself to all but *one bunch* of my finest grapes, leaving the mildewed one's scarcely touched. Had I caught him in the act, I *think* I should have been disposed to pepper his footsteps with small shot; as it is, my *best* grapes are gone, and *they were not ripe by at least a month*, though deeply colored.

The concluding paragraph of my article in Hovey, reads thus: "We shall take care to ascertain all particulars as soon as practicable, and make them known when we are satisfied fully of their perfect correctness, not speculating carelessly with the credulity of our co-laborers or the public, but giving them the true result, whatever that may be." What is this result? It is, as far I know and believe, a very important one to pomologists generally. My two seedlings, from the *Hamburgh fertilized by the Isabella*, have lived through much neglect, and *borne triumphantly the frosts of four winters*. They are at this moment in as good health as can be under the circumstances, and fully deserving of the utmost care. The fruit so far has not been as *large* as the Hamburgh, but it is *thin skinned*, and has a soft and pleasant pulp, wholly unlike the Isabella. Is it hardy? I have told you what I certainly know and believe, that my seedlings are as hardy as the Isabella, and bear fruit *equal* to the Hamburgh in everything but *size;* better cultivation may give them that. In

foliage they more nearly resemble the Hamburgh, though some of my friends here think them distinct; the leaves are "very deeply serrated."

The bunch the thief left is not a good specimen to judge by, but poor as it is, I send it to you. The fruit is not ripe yet, but you can tell, perhaps, *what* may be thought of it.

Yours very truly, &c. WM. W. VALK, M. D.

Flushing, L. I., Sept. 13, 1851.

REMARKS—The bunch of grapes referred to by Dr. VALK, reached us in excellent order. At first sight the *bunch* resembles that of the Isabella—the grapes being hung somewhat loosely upon it. But the berries are round—blacker than the Isabella, and totally distinct in flavor from our native grapes—resembling the dark colored foreign grapes. There can be no doubt that this is the first genuine cross between the foreign grapes and our natives, and if the cross realizes the promise of this single bunch—evidently a poor sample of the product of the vine—this new seedling of Dr. VALK'S will soon become widely sought after. The fact that hybrids may be raised, being settled, we shall expect to see a new and delicious class of hardy grapes springing up in this country, admirably adapted for the table and for wine, and perfectly suited to our climate. ED.

SUPERPHOSPHATE OF LIME FOR TRANSPLANTING TREES.

PROF. LINDLEY.—IN THE GARDENERS' CHRONICLE.

There are no doubt places in which all the skill of the planter will at first fail in getting trees to grow, but even in such cases he need not despair; the cause of his failure usually is, not that the soil is absolutely unfit to support vegetation of any kind, but that the circumstances being highly unfavorable, the plants are not able to get over that shock to their systems which they always suffer in ordinary transplanting. It is evident that plants which are moved with bare roots, as young trees are, must receive a far greater check than those which are moved with a ball of earth; and it is very often found that a little extra care in the planting is well repaid, because if the tree survive this check, and form fresh roots, it will generally get such a hold upon the soil, that it is then able to grow up, and form a healthy tree. In planting the most barren and exposed situations then, particular care must be taken, and it appears in such cases to be well worth while to add some "improver" to the soil, thrown into the holes in which the trees are planted. The quantity required is small, its cost need not be great, and the labor of using it is a trifle, compared with the good effect produced by its application.

The effect which it is desired to produce is the formation of fresh roots, and any substance which will cause the plant to throw out a quantity of fibrous rootlets, will enable it to overcome the evil effects of its being transplanted. It appears that phosphoric acid possesses a very great and remarkable influence on the development of roots, causing plants to throw them out with unusual vigor; we do not know of any very satisfactory explanation of this phenomenon, either chemical or physiological, but of the fact itself there seems to be no doubt. The most convenient mode of employing this substance is in the form of superphosphate of lime, as it is called, that is to say, a mixture of oil of vitriol and burnt bones. This compound, which is rich in phosphoric acid in a soluble state, may be readily mixed with a little dry mould, and it then forms a most valuable aid to the planter; a little of the mixture being thrown in round the roots of the transplanted tree,

aids greatly in the formation of root fibres, and consequently assists very much in establishing the plant in its new situation. Or, if scattered over the soil next the roots, before it is finally watered after planting, it is well distributed to the places where it is most required.

When a young tree has its roots thrust into such a hole as is made by a single cut of a spade, or even by two cross cuts, the roots are crowded together, and crushed into a small space; they are unfitted therefore to collect and absorb nourishment, at a time when the plant stands peculiarly in need of it. Not only is the freshly-planted tree able to obtain little food by means of its roots, in consequence of the mode in which it is planted, but the supply of nourishment is at the same time also diminished in consequence of the change of soil. In all cases the soil of the nursery or seed plantations, having been repeatedly dug over, and more or less manured, is better suited to the growth of the young plants than the soil into which they are transplanted can possibly be. When a plant is moved from one soil to another its growth is always checked, and the first step which it makes towards repairing the evil thus caused, is the formation of fresh roots; by bad planting this is made as difficult as possible to the plant.

It is hardly fair to compare together the growth of trees with that of the ordinary vegetables which are cultivated in our kitchen gardens; of course the conditions necessary to the growth of an annual, differ from those proper to the healthy development of a slow growing tree, which requires a long series of years to arrive at maturity; but even in the case of common garden crops, the same general effects to which we have just referred, may be observed. In almost every case where it is desirable to increase the development of roots, phosphoric acid is of the greatest value. When we wish to force young plants, to push them forward as fast as possible, so that their roots may get some hold upon the soil, the superphosphate of lime is one of the best manures we can employ. The mode in which that substance brings forward a crop of turneps is an illustration of this, and the remarkable way in which it assists the growth of the young plants, getting them rapidly into the rough leaf, and producing a more marked influence on their growth then, than it does at any subsequent period, appears to depend chiefly on the fact that it aids them in the formation and development of roots.

Superphosphate of lime is, therefore, a very valuable fertiliser in the hands of the planter, but in using it he must always remember, that as his plants must necessarily absorb the whole or the greater part of the soluble manure which he gives them, he must take care not to give too much. He must not suppose that if one handful will do good, therefore ten handfuls will do more: it is very easy to give too much, and plants, like animals, may equally be injured by over feeding or by starvation.

ACCOUNT OF MRS. LAWRENCE'S GARDEN, NEAR LONDON.

BY H. C. KEMP.

[We quote the following description of the place most celebrated in England for the high cultivation of the plants and the richness and variety of the exotic flora it contains. Mrs. Lawrence's plants are as nearly perfect as plants can be, in beauty of growth and completeness of development, and she uniformly carries off the majority of the prizes at the great London shows, where she has the combined skill of all England to compete with. The account is taken from an interesting little volume lately received, on the *parks and gardens* about London. Ed.]

Mrs. Lawrence's gardens at *Ealing, Park* have acquired, and justly, a universal reputation, on account of the superb collection of plants which they contain, and the general taste displayed in the arrangement of the place. As they are most generously thrown open to the public for one day in each week during the summer, they demand to be pretty fully described.

The entrance to the park is at the eastern corner, and after passing through the gates, the drive turns to the left, and crosses the open park till it reaches a long piece of artificial water, over which it is carried by a low bridge,—which is in fact a neck of land dividing the lake into levels,—and soon arrives at the house. There is also a walk from the lodge to the house, just along the belt of plantation which covers the northern boundary. In the lake is a pretty island of weeping willows, which shows well from the house. The drive, walk, water, &c., were planned by Brown; but the southern belt of plantation was afterwards thinned out with great judgment and effect by Repton, who saw that it was concealing the views into the country across the Surrey Hills, and of the Kew Pagoda, gardens, &c., and caused several varied openings in the line of plantation to be made, thereby greatly enlivening and expanding the place.

From the house, which is so unfortunately contrived that the offices are on the south side, and can only be gained by passing the principal entrance door, an opening through an architectural wing wall at the north end brings us at once into the pleasure grounds. This wall is also used to connect the house with a conservatory, which stands on the right as soon as the garden is entered, and is generally filled with Camellias, or other large flowering plants that are not grown as specimens.

At the other end of the house, a short colonnade is thrown out, and supported by low evergreen trees, through which the access to what is called the "Italian walk" is given. This is a straight walk on a descending slope, with pairs of small figures on pedestals at either side of it, and good specimens of Irish yew between these. It terminates in a moderately large circular basin of water, in the center of which, on a sufficient pedestal, is a figure of Apollo. The walk is kept confined towards the end by large evergreens, which narrow the vista, and restrict the view pretty much to the principal terminating object in the middle of the basin. The figures on the pedestals at the sides are arranged in pairs; on one pedestal Mars and Venus being placed, on another Cupid and Psyche, on a third Castor and Pollux, &c. The general effect is classic and elegant, and consistent with the style of the house.

The lawn view from the front of the house is rich and varied. A great many specimen plants, especially of the coniferous tribe, are scattered about upon the grass, and their lower branches lie down upon it in the most graceful manner. A rustic arch, through

which a small fountain is seen, and some fragmentary classic ruins, jut out from the mass of trees and shrubs at different points along the northern boundary, and prevent the abundance of green vegetable objects from degenerating into sameness. Certain cross avenues, however, break up the principal glade more than is desirable. One of these avenues is of *Cupressus macrocarpa*, backed by mixed evergreens. Near the house among other choice specimens, is a large plant of *Arbutus procera*, which, with its smooth stems, and fine clusters of fruit in autumn, has a striking appearance. *Garrya elliptica* is also large and handsome, and is a most valuable shrub for winter flowering.

When the basin of water is reached, it is found to contain four other figures on pedestals, one of them representing Neptune, and another a mermaid, and the remaining two herons. On the east and west sides of this pond, the ground rises into a bank, with large masses of evergreens on the summit. The bank to the east is the highest, and has a splendid Cedar of Lebanon upon it, the branches of which are held up by ivy covered props, so as to allow of its being walked under. Close to this bank is the dairy, a pretty object, and decorated inside with a row of busts on brackets against the upper part of the walls, with flints, shells, &c., on part of the shelves. The door is of stained glass, with wreaths of roses and other flowers.

In the neighborhood of the dairy, under the large evergreen trees, is an oval arch, formed with masses of fused brick, and supported on either side with a miniature rockery of the same material, clothed with ivy, &c. The design of the aperture is to afford a sudden and confined view towards the park, embracing part of the lake, on the margin of which latter some masses of fused brick have been set up to form an object to this view.

Were the scene more definite and contracted, and did it embrace one principal and striking feature, it is probable that this idea of an oval opening, which starts from the level of the ground, and is about the height of a full-grown man, would be very effective, by yielding a kind of telescopic view without the awkwardness and trouble of having to approach so closely to a smaller aperture, or to move about with effort in order to obtain the desired survey. A better example occurs on the outer side of the round pond, where, after threading our way amongst large laurels, and other evergreens, which group themselves into a natural retreat called the Leicester bower, and turning at length between shaded masses of fused brick, which furnishes a shaded home for ferns and alpines, we come all at once to another oval aperture, through which we look out to the pond and its figures, with the grassy bank and noble evergreens beyond. Here there has been more preparation, by a winding and uncertain path, in deep shadow, among imitation rocks, of which the arch forms a part; and the burst of light which we suddenly obtain through the arch, with the limited nature of the view, and the existence of a more definite object in the pond and figures, render this much more satisfactory, and, indeed, decidedly artistic.

We cannot but remark on the felicity with which the oval figure has been chosen for framing these little scenes, and how well the shape and size of the aperture fulfil its intention. Any more irregular opening would have the effect of scattering too much the objects to be revealed, whereas this serves to concentrate and confine them. A circular aperture, again, would produce the same bad result as an irregular one, unless it were quite small, when it would have to be looked through with effort, and the whole scene would be taken in only by degrees. The oval, on the other hand, as here adopted, is in itself a beautiful figure, and directly the eye catches it, all that is wished to be seen through it is exhibited at once. The suddenness with which the view opens upon us is fully half of the charm. Any gradual unfolding of the scene would ruin it.

Following the walk which runs along the boundary of the pleasure grounds, we see how nicely these are separated from the park. A very low hedge is placed in the bottom of a hollow, and its line its broken by a few dwarf evergreens, such as Rhododendrons, scattered here and there regularly along the inside. Standing on the walk, therefore, or the lawn, we scarcely observe this boundary line, because it is so low and unobtrusive, and does not at all arrest the sight, while it is quite hidden from the other side of the place.

Around some of the plantations at this end of the park, luxuriant masses of the double-blossomed furze form a broken and beautiful fringe, carrying the line of plants well down to the ground, and blending it with the grass, besides making a very brilliant display in the blooming season. Tufts of this furze, or of various brooms, scattered along the margins of park plantations, would often be exceedingly valuable in giving roundness and finish to their outline, and would furnish splendid patches of color in spring, besides being green and lively through the winter. In this part of the pleasure grounds, the varied openings occasioned by Mr. Repton's operations on the southern belt are especially conspicuous and important, as that belt is so comparatively near.

Two other avenues, besides the one already named, cross the principal lawn of the pleasure grounds. That farthest to the west is composed of Deodar cedars, with a row of Irish yews in front of each line of them, the yews alternating with the cedars. These deodars, of which there are some in other parts of the gardens, are very beautiful specimens, and must, in time, become grand objects. This avenue is terminated by a small temple at the north end, containing a statue of the Dying Gladiator. The temple was much used by Pope when Lord Warwick was proprietor of this place. Another avenue is of *Araucaria imbricata*, the plants being very regular and healthy, and having lines of *Cupressus juniperoides* in front of them.

In addition to these avenues of choice plants, great numbers of rare specimens are placed about the lawn. There is an unusually large and good *Abies Webbiana*, *Aralia japonica*, a fine Catalpa, many scarce and beautiful pines, firs, &c., and some very excellent variegated hollies.

At the west end of the garden, a cedar of Lebanon has been used as the nucleus of a small detached plot, planted to resemble a cemetery of the Crusaders said to be still existing at Jerusalem. Its surface is varied by masses of fused bricks, thrown up into irregular shapes, and formed in one part into a rude and picturesque arch. Groups of the same materials are continued from this spot into the pleasure grounds, at the side of a secluded walk, which affords an exit from the place towards Brentford. All these masses are partially clothed with ivy, and having generally a rugged outline, it is remarkable how speedily the ivy disguises the meanness of the material, and converts it into a beautiful feature. Irish yews, junipers, savins, weeping willows, &c., constitute the other and appropriate ornaments of the so-called cemetery; which must be looked at solely as a picturesque episode in the garden, and without reference to its avowed purpose.

Nearly adjoining the plot just described is a large circular hollow, surrounded with masses of shrubs and trees, and having a fountain in the center, which plays over a pile of moss-covered rocks. On the west side of this spot is another fountain, half shrouded by trees, which are mostly weeping willows. Many of the trees here take picturesque forms, and are covered with ivy. The water trickles over masses of stone, clothed with many species of wild plants, and is very pretty in summer, or when the sun is shining. This little scene is quite complete in itself, and being in a corner, and a hollow, much shut in by plantations, it furnishes an agreeable change.

In a survey of these pleasure grounds there is much to satisfy and please. A great deal of variety, and several delightful minor compartments, are secured. In general, too, there is much harmony and good taste shown in the arrangements and the decorations. The leading cause for regret is that the breadth of the lawn has been sacrificed to obtain the cross avenues we have spoken of. These lines of plants cut up the lawn very much, and destroy all appearance of openness or extent. Two of them are likewise altogether without an object; and as the plants in them all grow up, we can only conceive of their becoming still more objectionable. Scarcely any consideration can ever justify the use of lines of plants *across* a lawn that comes into view from the house; and the only show of reason which can be assigned for their use in this case is, that they supply the means of exhibiting some highly beautiful plants to great advantage.

A quiet walk from the western side of the lawn leads through the plantations, beneath an arched trellis embowered with climbers, to the department in which the plant houses are situated. And here the real treasures of the place begin to develop themselves. In regard to the size and rarity of the specimens, the superiority of their cultivation, and the quantity possessed, there is probably no collection in Europe which, in all these respects, can at all rival this.

A walk through the plant houses supplies continual food for wonder and admiration. The conviction is pressed upon us at every step that the power of cultivation "can no further go." And everything is done with a liberality as to space and conveniences which is quite of a piece with the fame of this establishment. The well-known success which attends the exhibition of plants from this place at the great metropolitan shows, will no longer be matter of surprise after the collection is seen. The only occasion for astonishment will be that any other competitor should ever be able to carry off the highest prize.

At the front of the principal group of plant houses is a somewhat square area, arranged as a flower garden, and having little wire temples, as supports for climbing roses, at the corners. Walls covered with climbers inclose it at the sides, and the charming *Clematis montana* is among the most conspicuous plants on these walls. There is a fountain in the center, and some vases are placed about in parts, while masses of stones at the base of the buildings, and in front of them, receive a variety of pretty trailing and alpine plants. The flower-beds are cut out of the grass, and are each furnished with a single kind of plant, in the usual manner.

The houses, which are composed of a series of span roofs, slightly varying in height, occupy a considerable space, but they do not present one uniform front. The two end compartments, which are supposed to be about 20 ft. wide by 75 ft. long, and each of which is covered by a span roof, are devoted to greenhouse plants. Between these and the centre of the group, there are two short houses, about 15 ft. long, against the back wall, leaving an open gravelled space in the front of them. These small houses are assigned to tall Cacti, large specimen plants, or a mixed collection. The central compartment is about 55 ft. wide, by 75 ft. long, and is roofed by three parallel spans, the middle one being highest. The whole of this portion is kept at stove heat, and it has a glass partition across the middle, separating the stove plants from the orchids. Two other glass partitions in the back part divide it into three unequal spaces, the larger middle portion being given up chiefly to the *Amherstia*, a small aquarium, and some mixed orchids and stove plants, while the side divisions are filled with orchids alone.

The first thing which we notice on entering the plant houses is, that they are raised fully 3 ft. above the ground level, and that therefore they are very dry, and may be made as airy as can be desired. Our next observation is that, although preparing the plants for

exhibition is one of the primary objects of consideration here, yet the houses are constructed and the plants arranged so that they can be examined comfortably and displayed well. There is no want of neatness and finish in the buildings; and the stages, paths, &c., are contrived, and the plants disposed, as if everything were intended only to be enjoyed at home. There is no crowding, no inconvenient effort to make the most of the space, no putting the plants where they cannot be fully seen. Everything is planned with great simplicity, and each plant has a sufficient space accorded it to allow it to stand perfectly free, and bring every part of it into view.

A leading feature of the collection here is that the plants grown are all of the most ornamental kind. Although the bulk of the specimens are of rare kinds, and many of them are quite new—for Mrs. Lawrence spares no expense in obtaining the first available plants of a good new species, and often procures the original specimen—yet none but the really showy members of each tribe are cultivated, and everything that is not fit for making a fine display is excluded. Hence, there is scarcely a plant in the collection that does not, at some season of the year, perform an important part in maintaining its attractiveness; and all are capable of being so thinly placed about on the stages that each will have ample room to grow and to exhibit itself.

To obtain *large* specimens is another grand point aimed at here. But this is only sought in so far as it is compatible with extreme *density* of habit, and a complete *mass of bloom*. Plants that look old or ragged are not allowed a place. And the desired result is attained by growing the plants in large pots, (only the common pots and no kind of tub being used,) and employing rather coarse and lumpy soil, partially mixed with drainage materials. There is also a regular system of pruning and training adopted from the earliest stage of each plant's growth, so that it is never permitted to become thin or straggling. With many of the species, the shoots of young plants are stopped back several times in each year, and the most careful and constant attention is given to keep each shoot in its right place by sticks and ties. This plan, of course, imparts to the plants a somewhat formal appearance, and causes some of them to present a little forest of supporting sticks. But as the specimens become old enough to bloom well, they are less rigidly pruned, and begin to require fewer sticks, acquiring altogether a more natural aspect. Indeed, it is pleasing to observe that it is now becoming more the fashion to allow plants to take their natural shapes, with less help from sticks, and only so much pruning as will secure a broad and close mass of flowers.

Provision is likewise made here against the loss of larger specimens, or the having to discard them on account of their size or poorness, by bringing on a succession of plants in different stages of growth; young specimens being generally found more healthy, and richer in all the qualities of show plants, except mere size.

For the facility of removal, and also to render each plant more manageable, and prevent the stronger growing ones from injuring the others, everything is here grown in pots, and not planted out. When, therefore, a plant becomes large, or bare, or unhealthy, or in any way undesirable, it can be instantly taken away, without making any gap in the collection. And for the recovery of specimens that may have fallen into bad health, or for retarding the bloom of those which are wanted at a particular time, or for retaining any specimens in bloom that may be required for a special purpose, there are various subordinate houses, pits, and large wooden boxes or frames, in which any of these objects can be quietly carried out. In moving about large specimens, too, a contrivance is here adopted which is very simple and efficacious. It consists in putting an iron hoop capable of contraction or enlargement according to the size of the pots, round the pot to be moved,

just beneath the rim. This hoop is furnished with two strong hooks, one on each side, beneath which two hand spikes made to fit them are placed, and the plant is then carried as if it were on a hand-barrow.

In the greenhouses the most perfect ventilation is provided for by opening all the side lights, so that during the hottest weather the houses may be kept comparatively cool; and, after the occurrence of great moisture, they may likewise immediately be dried. Beneath the stages, moreover, there are small slides or shutters, for further ventilation; and these are very useful in winter, as the air they will admit passes over the heating pipes. By their means, likewise, the floor and lower parts of the house can be kept dry. The stages are, for the most part, covered with a thin coating of gravel; and, to bring the plants as near as possible to the glass, and secure to them a greater amount of air, and guard them against becoming too moist, each of the specimens is generally raised on a large pot, so as to stand from 18 to 30 inches above the stage.

It will of course be impossible, were it even worth attempting, to do more than point out some of the general features of this collection. The two principal greenhouses contain nothing but specimens. The plants in them that are most conspicuous are Boronias, Epacrises, Polygalis, Eriostemons, Pimeleas, Leschenaultias, Croweas, Chironias, Chorozemas, Hoveas, &c., with a few climbing plants trained to low trellises. *Crowea saligna*, *Coronia crenata* and *serrulata*, *Chorozema cordata*, *Pimelea spectabilis*, all the Eriostemons, especially *E. buxifolium* and *intermedium*, and the charming old *Leschenaultia formosa*, are some of the plants here cultivated, which flower abundantly in all stages of their growth, and are of a free and excellent habit. Some idea of the size of many of the plants will be conveyed by mentioning that *Pimelea spectabilis* is 27 feet in circumference, and that, from the edge of the pot over the whole surface of the plant, there is scarcely space enough to allow of the hand being introduced between any of the branches. Nearly every one of the shoots is crowned with a bunch of blossoms in the summer. *Gompholobium polymorphum grandiflorum* is treated as a bush, and makes a beautiful plant in this state.

In the stove the plants are equally good of their kind. A great many handsome climbers are here grown to trellises, and a few of this tribe are also trained up the slender pillars which support the roof. The *Allamanda cathartica*, *Schotti*, and *grandiflora*, *Stephanotis floribunda*, *Convolvulus pentanthus*, *Hoya imperialis* and *Bedwilli*, several species of *Ipomæa*, *Echites*, *Æschynanthus*, and *Combretum*, *Clerodendron splendens*, &c., are some of the principal dwarf climbers, and are in great perfection. *Medinilla speciosa*, a rare and exceedingly ornamental species, with very large leaves and conspicuous drooping spikes of pink flowers succeeded by showy crimson fruit, is in an excellent state, and blooms for several months.

A glass partition, with a light iron frame (the rest of the houses being of wood,) separates the commoner stove from the orchid houses, and from the compartment devoted to the *Amherstia*. Of this last, there is an extraordinary specimen, which is, perhaps, the greatest feature of the whole collection. It is now quite a little tree, although it has only been here four or five years, and has flowered here for the first time in Europe, very few other plants of it existing in England. At the present time (January, 1851) it is again showing a quantity of bloom, which usually expands about April. The leaves, which are pinnated, and are paler in the young state, are of the handsomest and amplest character, forming a head of the most graceful kind. The flowers are vermillion-colored, and are produced in large drooping racemes, after the manner of a laburnum or *Wistaria*. It is a native of the East Indies, from whence it was obtained through Dr. Wallich; and has reached its present state of perfection here in a surprisingly short period of time.

As it deserves, the plant here receives every attention. It is placed near the back of the house, and grows in a large tub, plunged in a bed of bark. An extra heating pipe passes round the plant, within about two yards of the tub, and an open zinc gutter for containing water is fixed to the top of this pipe. In the front of the plant is a small basin for aquatic plants; and provision is made for spreading over the plant, beneath the glass, an oiled calico screen, which runs on rollers, and which, when used, at once furnishes any required shade, and protects the leaves of the plant from the water that might drop from the roof. A high temperature and a most atmosphere are preserved.

Besides some interesting aquatics, a number of gold fish are kept in the basin opposite the *Amherstia*, which is, moreover, furnished with a fountain. The back wall of this house is also partly clothed with ferns and orchids, and a few of the more purely tropical stove plants and orchids are placed at the sides of the house; but a considerable open space is wisely preserved in the middle, so as to give more consequence to the *Amherstia*, and cause it to be better seen. The *Barringtonia*, with its noble leaves, seems quite at home in this close stove; and there is a large plant of the curious *Grammatophyllum*, with a very beautiful climbing *Lycopodium*, which has large bluish fronds.

One of two small orchid houses on either side of that which contains the *Amherstia*, is used for Mexican species, and the other for such as require a rather higher temperature. The collection of both these tribes is good, and the plants well grown, but not remarkable. By the side of the paved path, and partly under the stage, there is an open channel or gutter provided for carrying off any water that may be used in syringing the plants or washing the paths.

Behind the larger group of houses there is a very nice heath house, with a western aspect, and full of the choicest specimens in admirable health. Other and smaller houses are devoted to Pelargoniums, which are placed on stages, to Azaleas, to stove plants requiring bottom heat, and to miscellaneous articles. The Azaleas stand in pots, like the green-house specimens, and are most splendid examples of cultivation. As with the green-house plants, (and also with the heaths,) there are successional or younger specimens, which are preparing to supply the place of the larger ones when these wear out or become shabby.

A small stove, which contains a bark bed, in addition to the usual heating power, is almost wholly filled with Ixoras of different kinds, plunged in the bark. They are superb plants, and this method of treatment keeps them very luxuriant. *I. javanica*, which is nearly new, has attained a considerable size here, and produces its pale orange flowers most profusely. An extraordinary specimen of *Gardenia Fortuni*, some Rondeletias, &c., are kept in this house likewise; and a wire trellis is beautifully covered with the charming *Dipladenia crassinoda*. Another small stove, with a similar bark bed in the center, and heated by a tank traversed with hot-water pipes beneath the bark bed, is occupied with various kinds of *Æschynanthus*, Gardenias, and such other plants as flourish best with bottom heat. The very best effects result from this mode of plunging certain kinds of stove plants in a material supplying bottom heat, as they never thrive half so well under any other system of management.

A span-roofed house has lately been built for the East Indian orchids, on the north side of the area containing the plant-houses. It is heated by hot-water pipes, which pass all round it in the ordinary way, and has no other heating material. The species belonging to the Vanda tribe are chiefly grown here. There are some noble plants of *Aerides* and *Argræcum eburneum*. And the entire contents of the house are so excellent that they are only surpassed by Mr. Rucker's collection. It is a most desirable plan thus to

bring this class of orchids together in one house, as well because they can thus be more appropriately treated, as on account of the effect produced by such a combination of exclusively elegant forms.

Calceolarias, Cinerarias, tall Cacti, and many tribes that we need not mention, are cultivated here in the best order in other houses and pits. Our notice, indeed, can by no means do justice to the place, which contains, even among its minor features and mechanical agents, very much that must interest the general cultivator. For example, there are several large box-like frames, made high enough to contain moderately large specimen plants, and capable of being covered with oiled calico or with glass lights, and ventilated by small slides at the ends, which, with an eastern aspect, are well adapted for receiving plants that have been newly potted, or such as are out of health, or those which may be wanted to be kept from blooming so soon, or to be preserved longer in flower. There are also some very convenient span-roofed pits, the lights of which work on a kind of hook-like hinge at the top, and are fastened down by iron pins in windy weather. There can be little doubt that pits of this description, made about 7 ft. wide and 4 ft. high (or a little higher) in the center, with the lights to lift up (not slide) from the side, and capable of being taken off altogether if required, are in all respects the cheapest and the most convenient, and the best structures in which to grow those green-house plants that may be wanted for decorating a conservatory, drawing-room, or other place where flowers are chiefly demanded.

As a screen to some of the out-buildings in the plant house department, a strong privet hedge is employed, the treatment of which struck us as worth mentioning. The top of it is cut into a series of crescent shapes, the hollow of each crescent having the closely-pruned head of a standard rose just rising above it. A character by no means common-place, and which may serve as a hint to improve upon, is thus obtained.

The period at which the greatest display of flowers may be seen at this place, is during the month of May, when the majority of the house plants are in their highest glory. In June, also, they are almost equally fine; and in so large an establishment there will, of course, be many plants in flower at all seasons.

HOW TO HAVE ROSES IN WINTER.

BY WILLIAM CHORLTON, STATEN ISLAND, N. Y.

Dear Sir—As the winter flowering of roses is a matter of some importance to all lovers of flowers, perhaps a few plain directions by which they may be successfully grown and brought to bloom with little trouble or expense, from November till May, will be of service in your journal.

My present purpose is with the amateur and those having small green-houses managed by themselves, without the assistance of professed gardeners. How many of these structures do we see which are in themselves unsightly objects, but which, by a little more knowledge in the matter, would become gems of beauty. It is the duty of all competent gardeners to assist in the general dissemination of the knowledge they possess; to lend a helping hand to the enthusiastic lovers of flora, many of whom, for want of a little practical information, meet with constant vexation in their little operations. Our calling will never be injured by such a course. No profession will ever advance one jot the faster

towards perfection, or be better paid by wrapping its details in mystery. Disseminate and diffuse knowledge, and the more extensively and enthusiastically will it be sought after, the greater in number will be its proselytes, and the more the demand for those who practice in its various spheres. Circulate experience, and pedantry will fly before it. Extend true practice, and pretension and empty boastings will hide their heads, leaving an open field for improvement.

But to my point. In the first place, select in the spring as many good stout bushes as there is house-room for, and let them be of the following kinds: (Chinese)—Queen of Lombardy, Mrs. Bosanquet, Agrippina, or Cramoisie superieure, old China, and Triumphant. (Tea scented)—Antheros and White Tea. (Noisette)—La Pactole. If there is room for spreading branches, Lamarque and Cloth of Gold, or Solfaterre, may be added, which, if allowed to grow without being shortened-in, will bloom freely. (Bourbon)—Hemosa and Souvenir de la Malmaison. Place these in pots suitable to their size, in a mixture of two-thirds rough turfy loam, and one-third good rotted stable manure, (incorporated well together, but not made fine.) Let the pots be well drained, and prune in the plants rather close; plunge the pots in the soil on a dry bottom in a shady place, for the summer. In the fall, if they have filled the pots with roots, and have made corresponding top growth, remove them into larger, being careful not to break the ball of earth; but do not remove them unless they require it. If not repotted, some of the surface soil should be removed, and the pot again filled up with fresh compost of the same kind.

If the foregoing preparation of the plants has not been made in the spring—the following course may be pursued. Lift carefully about the middle of September, a sufficient quantity of good plants of the foregoing sorts, and pot as above directed. These will not bloom so abundantly in November and December, though quite as much so afterwards. About the beginning or middle of October, according as the weather is mild or cold, wash the pots clean, and remove them into the house. At the same time prune away any dead or weak spray, place as near the glass as possible, *and exposed to the sun.* (The old exploded tan-bed is of little use where this is attended to.) Admit air freely over the heads of the plants, but by no means from front lights or outside doors, which only produces cold and damp under drafts. This point, in all plants growing in glass structures, is not sufficiently attended. It only reduces the temperature below, leaving the head of the plant warmer than the roots, causing stagnation to the growth, and encouraging, (in this climate more particularly,) the progress of fungoid vegetation, the sporules of which are continually floating in countless myriads in the atmosphere, ready to develop themselves upon various plants under favorable circumstances, the result of which is mildew or blight, in its various forms. It sometimes happens, if the weather is cold and damp, that roses are mildewed when taken up for housing. If the above directions in airing are attended to, and a little fire heat put on in the day in damp weather, it will soon disappear. If it should show itself any time afterwards, put on a little extra heat, and admit air from the top freely on sunny days, but keep the house closely shut up in stormy, and dull damp weather. By following this advice nobody need suffer from mildew when forcing roses. When, in the autumn, the nights begin to be cold, a little fire will be regularly required, increasing it gradually as the cold increases, observing to keep the temperature throughout the season at about 55° at night, allowing it to rise with the sun's rays to 70° or 75°, but not more than 60° in dull weather. Never use more artificial heat than is absolutely necessary. When the soil has become somewhat impoverished, say the middle of January, commence giving a watering with liquid guano, and continue it once a week, using one ounce to one gallon of water, or else taking instead, diluted drainage from a dung hill,

always applying either *in a clear state*. This will wonderfully improve the color of the flowers, and invigorate the plants. The red spider (Acarus,) which is sure to make its appearance, and will destroy all success if not kept down, may be eradicated by syringing occasionally with a solution of whale-oil soap, using one ounce to two gallons of water. Be careful to apply the wash to the *under side* of the leaves, as it is there mostly, where the pest lodges—using it in the evening, after a bright day, as too much moisture in the atmosphere is apt to spoil the flowers. The green fly (Aphides,) is easily kept under by occasionally fumigating with tobacco. No further care is required.

By following the above directions, any person with from twenty to thirty good strong plants, may gather a boquet of Roses every morning from the beginning of November to the latter end of May, previous to, and after which, there are plenty out of doors. A small green-house *well exposed to the sun*, and a small plot of ground outside, will produce roses every day throughout the year.

The above short list is not a tithe of the roses suitable for forcing, but they are sorts which will bloom without intermission so long as the plants are kept healthy, and freely exposed to the sun's rays. There are also many which have larger and more double flowers than some of them, but those mentioned are of different and distinct colors, from white to dark crimson, (including yellow,) and are beautiful in the buds, which are much more prized than the flowers by many. Hoping the above short hints may be useful—I am yours most respectfully, WM. CHORLTON, gardener to J. G. Green, Esq.

Staten Island, August 25, 1851.

STUDIES IN VEGETABLE PHYSIOLOGY—THE ROOT.

BY A. A. FAHNESTOCK, SYRACUSE, N. Y.

IN explaining the history of a plant, it is necessary to begin with the most important *parts*. The root is that organ which, in contradistinction to the stem, seeks to exclude itself from the light and air, and descend into the medium of the earth. Stems and roots, though sufficiently distinct in most plants, are in others often mistaken for one another; but the latter may be readily distinguished from the former by having no buds, and one regular ramification. The principle office of the root seems to be, to supply a copious quantity of nutriment, or sap, for the maintenance of the plant, which it does by "*Endosmosis.*" This term may be explained by the following example. When two liquids of unequal density are separated by a permeable membrane, the lighter liquid, or the weaker solution, will flow into the denser and stronger with a force proportioned to the difference in density—but at the same time a small proportion of the denser liquid will flow into the weaker, which is called "*Exosmosis.*" By the examination of any embryo, of the exogenous structure, we may gain a good idea of the peculiarities of the root. The radicle, or pre-existing axis grows in such a manner as to elongate throughout its whole extent, showing that it is not root itself, but merely the first joint of the stem, which thrusts itself downwards into the soil, while it raises two cotyledons, which supply the place of leaves until the cauline ones appear. Contemporaneous with this elongation of the radicle, a new and different growth takes place at the lower extremity, in a downward direction, which forms the root. The root, then, is a new formation of cells from the root end of the radicle; it commences by a number of very lax, tender cellular tissue, resting upon a blunt cone of woody matter, composed principally of woody tubes, con-

nected with the alburnum. The accumulation of cells is not upon its sides, but at the extremity under the thin epidermis and the superficial cells. The division of the cells from this point proceeds from below onwards, those which lie behind quickly extending to their full size, and remain in that state, while those which approach the apex multiply by continual divisions. In this way the root keeps on growing, and may be compared to an icicle, which lengthens from the point only; the only real difference being that the icicle elongates by continual accretions from the outside, while the growth of the root is from the inside. As this growth of the root is made from the under side of the extremity alone, it follows that that part is always clothed with a vitally active tissue. "The new cells,* however, do not occupy the extremity alone, as is commonly but incorrectly stated; this is capped, as it were, by an obtusely conical mass of older cells, consisting of the superficial tissue of the end of the radicle, pushed forward by the cell multiplication that commences behind it, as already mentioned.

"As the orignal cells of this apex wear away or perish, they are replaced by a layer beneath, and so the advancing point of the root, consisting, as inspection plainly shows, of older and denser tissue than that behind it, (the point of every branch of the root is capped in this way,) it follows that the so called *spongioles*, or *spongelets*, have no existence. Not only are there no such organs as are commonly spoken of, but absorption does not evidently take place to any considerable extent, through the older tissue of the point itself." Roots absorb nourishment by *endosmosis* throughout the whole of the newly formed tissue, and especially through the hair-like prolongations, commonly called the *fibrils;* these capillary tubes are of great tenuity, and have extremely delicate walls, and perform a more important part in absorption than is generally supposed. They perish soon as the growing season is ended, or when the roots become old and hardened—"at the same time the external layer of cells that bears them, at first indistinguishable from the parenchyma beneath, except perhaps in the size of the cells—hardens and thickens into a kind of epidermis, or firmer skin, so as to arrest or greatly restrain the imbibition. This epidermis of the root consists of less compressed cells than in other parts exposed to the light, and is distributed to stomates, or breathing fibres." The growth of the root keeps pace with the stem, as the latter shoots up and becomes clothed with branches and leaves, from which water is exhaled during healthy vegetation; the former grows onward, still renewing the tender hygrometrical tissue, through which the absorption required to restore that which is lost by elaboration, or consumed by growth, is principally effected; hence the danger of removing trees during the summer season, or when the roots are in rapid action. The growth of the branches and roots being simultaneous, while new branches and leaves are developing—the roots are extending at a corresponding rate, and greatly increasing the absorbing points, they cannot now be removed with safety to the tree, and at the very time when their aid is most required. But when the growth of the season is over, the leaves grow languid, and the rootlets also cease to grow, as the tissue of their extremities not being renewed, gradually becomes hardened, and loses its absorbing powers. This marks the season for transplanting, (namely,) before the growth of the season has commenced, or in the fall, after it is made. This elongation of the roots by their growing points alone, is admirably adapted to the situation in which they are placed, growing, as they do, in such an unequal medium as the soil. If the roots increased in the same manner as stems, they would be forced wherever the elongating force was insufficient to overcome the obstacle, or wherever this force was most powerful, and they would be thrown into all kinds of contorted shapes, very ill adapted to perform the services for which they

* See Gray's Botanical Text Book, new edition, p. 31.

are required. But, increasing as they do, by their points only, they insinuate themselves into the crevices of rocks, or yielding parts of the soil, and afterwards, by their expansion in diameter, enlarge the cavity, or when arrested by any obstacle, their advancing points follow its surface until it reaches a softer medium. In this manner they rapidly extend from place to place, as fast as the nourishment in their immediate vicinity is consumed. Thus roots extend in whatever direction the soil proves most favorable to their growth, without supposing any instinct or pre-science on the part of the vegetable, as we have before stated. "The advancing extremity of the root consists of parenchyma alone, but bundles of vessels and woody tissue appear in the forming root soon after their appearance in the primordial stem above; these form a central woody or fibrous portion, which continues to descend as the growing apex advances, sometimes, although not usually, enclosing a distinct pith, as the wood of the stem does."* We have taken the root as an epitome of the whole plant, for in its whole development it produces no other parts, nothing but naked branches emanating from one particular part of the root, but indiscriminately over the whole of the surperficial surface, all tending to increase the amount of absorbing surface. In reply to the statement that roots produce no other organs, there is this abnormal exception, namely, that of producing buds, which spring up into branches, and are clothed with leaves. Although the roots are not naturally provided with buds, yet, under certain circumstances, they will produce them; that for instance when a poplar or apple tree, gorged with sap, is cut down, the root will send up innumerable branches. The roots of the osage Grange habitually give rise to such stems, hence the utility of it in planting hedges. Some plants present a still more striking phenomena, such as the Bryophyllum, which has been known to produce buds on the margins of its leaves; all such buds are said to be adventitious.

"The root has been illustrated from the highest class of phenogamous plants, in which the original root, or downward prolongation of the axis continues to grow, at least for a considerable time, and becomes a tap-root, or main trunk, from which branches of a larger and smaller size emanate. Often, however, this main root nearly perishes, or ceases to grow, and the branches take its place. In some plants of the highest class, (in the gourd family for example,) and in nearly the whole great classes to which the grasses, and lilies, and palms belong, there is no one main trunk or primary root, from which the rest proceed; but several roots spring forth simultaneously f rom the radicle in germination, and form a cluster of fibres of nearly equal size. Such plants scarcely exhibit the distinct opposition of growth in the first instance, already mentioned as one characteristic of phenogamous vegetation. Most phenogamous plants likewise send forth *secondary* roots from the stem itself, the only kind produced by cryptogamous plants. Roots vary much as regards their duration, and have been divided into three grand classes. First, into *annuals*, which are those that spring up from the seed the first season and die; such plants are composed mostly of fibrous roots, which act a powerful part in absorption, but are good for nothing else. These fibres usually proceed from the sides of the tap-roots, or else the whole plant divides itself at once into numerous branching fibres, such as the *grasses*. The food which such a plant absorbs, after having been digested and elaborated in the leaves, is all expended in the production of branches and flowers. The flowering process and the maturation of the fruit greatly exhaust the resources of the plant, consuming all the nourishment which it contains, or in storing it up for the future offspring, and, having no accumulation of sap, the root is unable to supply the increasing demand, and the consequence is, it dies as soon as the growing season is over, or whenever the seeds

* Gray's Text Book.

are fully ripe. The second class compose the *biennials*, or such as live two years; these do not flower until the second season, when they die as the annuals; in this case the root serves as a reservoir for nourishing the assimilated matter, such as *starch*, *vegetable jelly* and *sugar*, (that is, its cells become gorged with these articles)—also, such roots receive the general appellation of *fleshy*, but have received different names according to whatever shape they assume. For instance, if the enlargement takes place in the trunk or tap-root, it becomes *conical*, as in the carrot. When it regularly tapers from the crown to the apex, it becomes *fusiform*, or spindle-shaped. But if it leaves the middle the largest, in which instance it tapers from both ends, it becomes *spheriform*, or turnep-shaped. If some of the branches are thickened, instead of the main root, they are said to be clustered. Such plants do consume much of the supply of sap in the production of leaves and branches, but they form a large tuft of leaves just at the surface of the ground, which supply the roots with nearly the whole summer's supply of nourishment. In the following spring, when reaction is commenced, it shoots up a large thrifty stem, with leaves and flowers, which is wholly supported by the nourishment of the previous year; and the plant, in the mean time, neglecting to form roots anew, gradually perishes from the *immense* absorption of the *external* part, (or stem.) This class includes a very large proportion of our most useful vegetables.* AUGUSTUS A. FAHNESTOCK.

* Gray's Botanical Text Book.

FIRST FLOWERING OF THE VICTORIA REGIA IN THE U. S.

BY CALEB COPE, ESQ., PHILADELPHIA

THE great event in our floriculture world just now, is the blooming of the *Victoria*—that queen of water lilies—at the country residence of the President of the Pennsylvania Horticultural Society. Mr. COPE'S zeal and spirit in the introduction and cultivation of this noble plant, have been most satisfactorily rewarded by a larger growth, both of flower and leaf, than the most skilful culture in Europe has yet attained. We give his letter, and the interesting account of Mr. ELLIS, below. ED.

A. J. DOWNING, Esq—Dear Sir: I am sorry that you were not here to witness the excitement which prevailed on the 21st ult., when the Victoria bloomed for the first time in this country, and when my grounds seemed to be in complete possession of the public. Since that event we have had a weekly contribution of a flower, the fourth one maturing last evening. The interest felt by the public appears not only unabated, but on the increase, so that every show day we have crowds of visitors from all parts of the country.

I hope before long to send you the drawing of my Victoria house, which you request. In the mean time I send you a report from my gardener, which will be interesting to those who wish to look into the detail of the culture and treatment of the plant. If you deem any portion of it worthy of insertion in the Horticulturist, you can make use of it.

The committee on plants and flowers of the Horticultural Society, were present on the second flower blooming. They measured the petals, which they found seven inches in length, and the crown or disk of the flower three inches, thus making the diameter of the whole seventeen inches. This is three inches larger than any flower produced in England. The leaves are also six inches larger than any grown there. The natural conditions of the plant in our country are, undoubtedly, more favorable than they can possibly be in England. There the water is at 85° generally, and the atmosphere at 75°; here it is just the reverse, which is undoubtedly more like its native country. I am satisfied that we have

hit upon the right method of cultivating the plant; and that both flowers and leaves are equal to any found either in a native or foreign state, in any part of the world. Although all this has been accomplished at a great expense of money and personal exertion, I do not regret what I have done. I think I never have been so richly repaid in a similar effort. Even Mr. LONGWORTH, who regards so much of what is new in his favorite path, as humbug, says, in a letter which I received from him to day, that "there is but one plant in the world—the Victoria." He adds, however, that he will present me with a fresh-milk cow, if he fails to grow the lily without heat. By this he means that he can grow it in his pond. Our plant is also grown without fire heat. We have had no fire since the 21st June. The plant in the kitchen garden, which has had fire heat at no time, is very beautiful, and would bloom, I think, if it had been planted a month earlier. As it is, I am not without hope that it will yet give us a flower. The leaves are within three inches as large as the largest leaf spoken of by BRIDGES. Next season, if I live, I will show you a flower on the same spot, since you invite the effort.

The flower last evening was more gorgeous than any of its predecessors. As its conversion was going on, in its second stage, it seemed that the pink or red hue greatly preponderated over the white. I cut the flower, placed it on a thin circular board, a foot in diameter, which it completely covered, and sent it to a wedding party. I am in hopes that one of the buds, now visible, will bloom in season for our annual exhibition, which is to be held next week. I shall send two of the leaves—one of them to be placed under side up, so that the beauty of its architectural structure can be seen.

The Victoria is one of the few things that has not been exaggerated; nor is it possible to exaggerate it. It is truly a wonderful plant. Yours very truly, C. COPE.

Springbrook, near Philadelphia, Sept. 10, 1851.

A. J. DOWNING, Esq—Sir: As the experiment of cultivating the Victoria Regia at this place has resulted successfully, I propose giving a brief history of the attempt, not doubting that it will prove interesting to the numerous readers of the Horticulturist.

On the 21st day of March last, a letter containing twelve seeds of the Victoria Regia was received by Mr. COPE, from Sir WM. J. HOOKER, Director of the Royal Gardens at Kew. Four of these were planted in small seed pans, in loam and sand, and placed in a tank of water in the forcing house. This tank, which was five feet by six in diameter, was heated to the temperature of 85° to 95°, by a circulation of hot-water, produced by a copper box being placed upon the furnace, and an inch lead pipe, passing from it twice round the inside of the tank. A coil of half inch pipe, of about fifty feet in length, was also placed over the furnace, in order that the water might be tempered, which was destined to supply the tank. From this pipe the water dropped on a small tin wheel, which agitated the water in the tank, and dissipated the vegetable mucus or slimy matter which accumulated around the borders of it, and sometimes upon the edge of the leaves of the Victoria, after it commenced growing.

Three of the seeds germinated as follows: The first on the 10th of April; the second on the 14th of April, and the third on the 22d of May. The fourth seed failed to grow. The first growth of the lily was in form of a spear, not unlike a young shoot of grass, and attained in length about an inch and a half. On the 17th a second leaf appeared, of a form similar to that of the Calla ethiopica, being long and tapering, from a broad blade.

On the 21st a third leaf appeared of like form.

25th, the fourth leaf reached the surface, and was in the shape of an ellipsis, one end, however, being separated, till near the point where the petiole and leaf were united.

May 3. The fifth leaf appeared, which reached its maturity on the 6th; was nearly round, and measured..... 3½ inch. in diameter.

9. 6th leaf appeared, it was quite round, and measured at maturity, ... 3½ " "

16. 7th leaf appeared, ... 4½ " "

23. 8th, do ..... 4½ " "

On the 24th the plant was transferred to the big tank in the lily house, which was especially constructed for its accommodation. It had five leaves on, the largest measured ..... 4½ " "

28. 9th leaf appeared; measured at maturity,..... 5 " "

30. 10th do do do ..... 6½ " "

June 3. 11th do do do ..... 9 " "

7. 12th do do do ..... 9 " "

10. 13th do do do ..... 12½ " "

13. 14th do do do ..... 14½ " "

16. 15th do do do ..... 18 " "

20. 16th do do do ..... 21½ " "

25. 17th do do do ..... 29 " "

29. 18th do do do ..... 3 feet 1 inch.

July 3. 19th do do do ..... 3 6 "

9. 20th do do do ..... 3 10 "

13. 21st do do do ..... 4 4 "

18. 22d do do do ..... 4 9½ "

22. 23d do do do ..... 5 2½ "

27. 24th. This leaf exhibited a beautiful salver edge, as have all its successors,..... 5 8½ "

31. 25th leaf appeared; measured at maturity,..... 6 4 "

Aug. 6. 26th do do do ..... 6 4½ "

10. 27th do do do ..... 6 6 "

This leaf is six inches larger than any produced in England, of which we have any account.

13. This morning we discovered, to our great delight, a flower bud rising a little in advance of the 28th leaf, which was also approaching the surface. The latter presented a dark object, whilst the former looked bright, though several inches deeper in the water.

15. 28th leaf; not matured.

21. Flower opened between five and six o'clock, P. M. Color, pure white; form, globular; very fragrant; odour strongly resembles highly cultivated Pine apples. On the subsequent day the flower remains in its primitive globular form, (with the exception of slight variation,) until five or six o'clock in the evening, at which time it undergoes a complete transformation. So novel is the appearance of the transformed flower, that were we not conversant with its nature to "metamorphose," we could not believe it *possible* to be produced from the same plant. The petals become reflexed, lie prostrate on the water, and expose to view a disk, so beautiful in color and form, that I am sorry I cannot find language to describe it adequately. In its form it resembles a crown of some of the ancient kings of England; especially so when the

flower has reached its climax. The disk, which first appears quite smooth and flat, becomes in a very short time perpendicular petalus looking anthers, surrounded by others of crimson, embosomed in pure white. Thus it floats in its glory through the night, declines as the rays of light approach the succeeding morn, and ultimately *sinks* into the element from whence it arose so noble and grand.

22. 29th leaf appeared; not matured.
31. 30th do do
Sept. 6. 31st do do

Sept. 8. We have now in flower the fourth bud, and two others are seen under the water. The flowers, (one of which measured 17 inches in diameter,) are produced at the base of the leaves, which induces us to believe that as long as the plant continues to furnish *new leaves*, so long may we expect flowers. At the present time appearances are altogether very promising. There are seven leaves on the plant, some of them measuring nearly twenty feet in circumference, and a weekly succession of flower buds.

You will observe that on the 24th day of May the lily was planted in the large tank. From that time up to the 20th of June, fire heat was applied in the evening only. During this period the thermometer ranged on an average at about 85°. On the 21st of June fire heat was dispensed with, and has not been applied since. The tank had been well prepared for the reception of the plant—first, by the bottom being covered with charcoal and pieces of brick, to the depth of two or three inches, and then half a dozen two-horse cart loads of chared loam and leaf mold placed therein in the form of a mound. I would here remark that good loam alone is sufficient for the plant. A different ingredient was adopted in this, our first essay, as a similar compost was found successful in England. Some material departures from the custom there observed, have been indicated as politic in the process of our experiments.

In reference to the temperature of water in the tank, after artificial heat was dispensed with, it has, of course, varied materially, being sometimes as low as 70°, and rising to 83°. To prevent the injurious effects of the direct rays of the sun, the glass of the house is frosted with sugar of lead ground in oil. The house is generally kept very close. Fresh water is freely admitted during the day, but none at night. From the lily house, the water flows into a basin in the kitchen garden, where one of the plants of the Victoria was placed on the 25th day of June; it had then five leaves on, the largest measuring fourteen and a half inches. The plant has made a slow growth, compared to its more favored companion in the aquarium, but it has nevertheless flourished, and its largest leaf now measures 3 feet nine inches in diameter. We do not doubt our ability to grow it successfully in this position next season, when the alterations proposed to be made in the construction of the basin, shall have been effected.

Under the influence of solar heat alone, the plant has made wonderful progress, and I think its beauty and luxuriance cannot be excelled in any part of the world. We can easily appreciate the admiration and delight of the enterprising DORBIGNY and SHOMBURGH, on their discovering this vegetable phenomenon, so gigantic in its appearance, unique in its formation, and deeply interesting in its development. When we contrast the seed in its first state of germination, and by an acute observation perceive its feeble cotyledon, like a thread, endeavoring to reach the water's surface, but unable—with its colossal leaves, between six and seven feet in diameter, well may we call it a "Vegetable Wonder," and the "Queen of Aquatics." We hail with delight the promised leaf, and watch its daily unfoldings with increasing interest. When we view its shell-like appearance when first

above the water's surface, quilled together into ridge and furrow of transparent golden hues, with its dark crimson veins flowing through its much admired tissue, its superb salver edge, and its huge rope-like stems, covered with elastic spines of surprising strength, as though destined to protect its noble structure from all invasion. When we look at the short period it has taken to germinate a seed no larger than a pea, and to bring to maturity a plant that fills a tank twenty-four feet in diameter, in the short space of something like four months, well may we affirm that it deserves the attention and culture of every true lover of nature who can afford the expense. Such amateurs will surely be amply remunerated by the constant unfolding of beauties not to be equaled in any other plant known to the civilised world.

It would be doing injustice to Mr. DOWNING, did I fail to mention that the first living plants of the Victoria which have grown in this country, were produced from seed furnished by him to the proprietor of these gardens, out of a supply presented to him last autumn, at Chatsworth. These were lost by the gardener then in charge of the place, as I understand, by an accidental over-heating of the tank, consequent upon a sudden change of the weather during the night. I am, respectfully, JOHN ELLIS,

Gardener to Caleb Cope, Esq.

Springbrook, Sept. 8, 1851.

THE BEAUTIFUL IN ART.

BY S. H.—FROM THE LONDON BUILDER.

THIS brings me to the third branch of my study, viz., the beautiful in art itself. Nature drunk in by the mind, as shown under the former head, is the seed for the production of a new world,—the world of art, which exists for the same purpose as its prototype, to satisfy the sense of beauty in the human breast. From a chaos of sensations previously awakened by the aspect of external nature in the mind of man, this new and fairer creation rises. A more perfect system, freed from the blemishes and faults of the first, is thus established in the sphere of art: the materials and principles, luxuriance and comprehensiveness, are derived from nature; while the fostering love of the beautiful, as the inspiration in the soul, gives it harmonious unity and depth.

Art is therefore something more than a transcript of nature even in her highest charms: it is essentially spiritual. It does not come from nature direct, but is refined and exalted in the mind. If art were no more than a reproduction of nature, it would be the inferior, as the imitator must ever be behind the original. But art takes higher ground; she has a dignity peculiar to herself, an essence of her own, which wins her the advantage. Art appropriates the principles and elements of nature, but in their passage through the mind, a fresh image is stamped upon her types. They receive a new lustre from the soul, a ray of the beautiful from within. The artist may exercise his genius upon a perishable material, but something from the immortal part of himself has mingled in his conceptions, and this gives to works of art infinitely greater interest than their originals could have. The main difference between architecture and the other arts of design, is this—architecture springs out of physical necessity, while the other fine arts have beauty for their sole object. Architecture is the application of abstract beauty, as much of it as can be applied, to the embellishment of the useful, that is to say, to the forms and elements of necessity. I say forms of necessity; but some of the general forms of architecture are struck out or

foreshadowed by nature herself. But the disadvantage of architecture is, that the useful must, in some measure, qualify the beautiful. Painting and sculpture have beauty for their essence, but architecture is a clothing, or pervading, the useful with the spirit of the beautiful. It is, however, the human architect, so far as consistent with the different scale of his enterprise, following in the footsteps of the Divine. That the primitive wood cabin was its type, may well be questioned. Infancy is as much the type of manhood. Architecture has better types, a richer dower; it has all nature, from the human form and face, to the most insignificant plant or mineral: all yield ther lesson to the architect. It draws not literally, however, from them. It is not a direct, but an analogical imitation of nature.

But art, taken generally, is an imbodiment of an invisible archetype in the artist's mind, his *beau ideal;* but which he models upon nature as a basis: it is nature transfigured, glorified, by its contact with humanity. Of all created beings, man, particularly as refers to the manifestation of his mind and character, is the most interesting to man; an object, therefore, on which is impressed human feeling and intelligence, possesses, in consequence, a greater interest than by any other extraneous circumstances it could receive. Works of real art are the works of God brought through the mind of man; and therefore doubly "good," beautiful, and divine.

Art may, in this light, be considered as a supplement which the human mind adds to nature. It is a sequel to her original beauty. Like "the metamorphosis of things into higher organic forms," is their change from nature into art. The mind or imagination of the artist is a mirror that gives back the formal hues of nature, but heightened and refined: while painting and sculpture array with second life some glorious action, some heroic deed of the past, architecture clothes with new vitality and beauty the forms of external nature.

The sculptured Jupiters and Minervas of the ancients, and the rest of their petrified goddesses and nymphs, are therefore, as remarked under the preceding head, not copies from nature, but from a vision of beauty in the mind of the artist, inspired indeed by nature, but exalted in the mind, and possessing more of perfection than any individual.

But whilst showing the advantage of art over nature in this respect, let us do justice to the latter. The eye requires education and constant practice, even to see truly the beauties of nature. All does not lie upon the surface. In the lowest walk of art there is scope for the highest mind. The most gifted eye cannot exhaust the significance of any object, and "in the commonest human face," to quote Fuseli, "there is more than Raphael will take away with him."

We cannot compete with nature on the same ground. For the production, for instance, of powerful light and shade in a picture, an artist must take advantage of the local color of objects, and place dark ones in the shade, and white ones in the light; while, such is the intensity of light in nature, that she can produce her effects independently of local color,—effects more gorgeous and potent than the artist, with all the contrivances of art, and of science to boot, is able to reach.

Moreover, the effects in nature are nearly always fine. Natural objects, whether viewed singly, or in groups, must be almost invariably picturesque, for both the linear and aerial perspective operate upon them on the most unerring principles—an advantage which the artist, from some error in applying the science, may miss. Light and shade, and reflection, which the artist can but imperfectly comprehend and represent, are also, in nature, acting unerringly.

The artist of a fine perception, is, therefore, of all others, the least satisfied with what

he produces, as he is the most capable of seeing the truthfulness and transcendancy of nature. He is also the most capable of seeing the immense distance between her commonplace, every-day effects, and those which she sometimes exhibits to the educated and poetic eye.

The comparative feebleness of art is further apparent when we consider, in the greatest works of art, how few the beauties, how many the faults; how seldom we find a picture that is good in more than one department of the art! The great colorist is deficient in composition; one wonderful in conception and composition, may have no idea of color: while the master of chiaroscurso is a novice in everything else; suggesting the fact, that only the union of the talents of several artists, supposing that possible, could secure a full, truthful rendering of nature. Each of these important departments has had its respective master, but where is the magician who, uniting their varied excellencies in one production, can conjure up before us the entire spirit and sentiment of nature, and reveal to us the whole mystery of creation?

Besides, from nature comes every element of art; within her sphere lies all the inspiration of genius. An abstract idea of beauty, it is true, exists in the mind, transcribed from no individual object or creature. But, as Pope asks, from what can we reason but from what we know? so, we may inquire, what can we conceive and image to ourselves, but from what we have seen? The first part of genius is a strong susceptibility to the influence of beauty in nature. And the Muses were rightly conceived as the daughters of memory: the great ideas which the Raphaels and Titians have sought to embody, however gradual their growth, have been indebted to nature for every stage of their advancement.

Architecture, as we have seen, in common with all the fine arts, derives its principle of beauty from nature; but unlike the rest, it is indebted to nature for something else, closely allied to, and in some measure interwoven with the other, viz: constructive principle. Structure is an important element of architecture, and fortunately for us, the affinity between it and nature extends also to construction. Of this fact many illustrations could be given, and of the use made of it by architects. The constructive principle of St. Bride's Church steeple at London, with its spiral staircase and newal, it is well known was derived by Sir C. Wren from a common form of spiral shell. The dome of the Cathedral of Florence owes its origin to the structure of the human skull, the peculiarity of which is its combining strength with lightness. The naval architect has obtained valuable hints for ship-building from the structure of shells. The figure of the duck originally suggested the form of the ship, and certainly the finest models, the best for contending with winds and waves, are those that most resemble their original, as the Dutch galliot will attest.

But, as in art, so in science, we cannot directly compete with nature; we cannot reach her wonderful mathematical skill,—the nice balance of forces,—resistance, and strain; we must waste our material, and, after all, be behind in that certainty which characterises her engineering enterprises, which is visible in her most ordinary productions.

Let us glance for a moment over the empire of art, with an eye to this analogy with nature. In music's various moods and instruments we recognise the various hymns of nature,—the murmuring stream, the melody of birds, the wind upon the shore in "vocal reed," which are music's acknowledged types. Many oft-used expressions, as "a tide of harmony," "floods of melody," "gush of song," are confessions of this analogy. Campbell speaks of the "stormy music of the drum;" Shakespeare makes music the food of love, and compares its dying fall to a gentle wind stealing over violets; and Milton's "heavenly host"

"Sang hallelujah as the sound of seas."

In the department of architecture we shall find equal interest. The "twilight grove" is seen in the temple colonnade, or "dim religious aisle." The "awe-inspiring dome" speaks of the canopy of the skies—the celestial hemisphere—which has in some instances been its model. The beautiful curves of the capitals and shafts of the antique columns are at least suggested by lines in nature. The earliest Egyptian column was a stalk of the lotus, capped by its calix; and its base was, in all probability, the foot of the same plant, where it issues from the root.

All descriptions of design are varied pictures or reflections of nature. Whether a single edifice, or group of edifices, or picturesque avenue, be the object of our admiration as a work of art, one source of our pleasure must be a recognition of principles dictated by nature, and a recollection of corresponding effects in her wide domain.

Every true style has its types in nature, every shade of character its corresponding expression there. The principles of design have been learnt in her school. In the decoration of architecture we shall find nearly the whole of the vegetable kingdom, which, though not literally copied, are yet the most easily traced. No department of creation seems better adapted for decoration in the arts of architecture, sculpture, &c., than this: plants, their foliage, flowers, fruits, have accordingly been more extensively employed, as the basis of ornamentation, than any other objects. In some Gothic buildings the abundance of floral decorations renders them rivals, in point of luxuriance, of Nature herself. Plants were very early thus employed. The almond, pomegranate, and flowers were chosen, even in the wilderness, by divine appointment, to give form to the sacred utensils; and, down to the present time, the ivy, lotus, acanthus, palm, vine, oak, and other beautiful objects of the vegetable creation have been the subjects of the chisel, and have given life and expression to architecture and the arts of decoration.

The types of art are in nature, but art, as before shown, cannot be entirely referred to that source. The soul of man has had part, and through that part may, generally, be read much that is interesting of the character and history of the times that produced it. The monuments of art are always the true representatives of the physical, moral, and intellectual state of man. They are the exponents of his religious and political position, and indicate the exact character of his mental development at the corresponding periods of his annals. Nations have written the records of their history in stone. The temples, the palaces, the monuments of Germany, France, and England are so many pertrified poems. The Vatican, the Escurial, the Alhambra, each unfold to us more than many volumes could have done, of all that is interesting to man, of all those absorbing and fascinating subjects on which we would question the past. Catholicism has written its history, and more than is ordinarily understood by history, in the monasteries, cathedrals, and monuments of the middle ages; and, whatever be its subsequent fate, the memory, at least, of its worship will need no other shrine. Liberty, commerce, and industry have recorded their enterprise, also, in the same characters. And the monuments of municipal greatness are not among the least of the trophies and achievements of architecture. Ambition has imbodied its yearnings and its triumphs in pyramids, columns, obelisks, triumphal arches; humanity in hospitals, and schools, and institutions of benevolence; and science in railroads, tunnels, aqueducts, and bridges. The edifices of England are so many chapters of our history. The genius of a nation, as well as of the architect, is stamped upon such relics.

We have seen that art is *one* in its origin,—that its waters, however diversified their channel, flow from one fountain, and its glories, however differing in hue, are reflections

of one infinite brightness: may we not go further, and observe that art is one in its real nature and object? In the infinity of beauty and of truth, pervading this mighty universe of matter and of mind, lie the inspirations of art; and it is from his fresher, deeper insight into this inexhaustible life, that genius derives his power, and his productions their value. No matter what his tools, whether colours, or marble, or stone, or sounding pipes and strings, or cadenced words, his work is the same; his eye has looked through and beyond the horizon of his time; his ear has listened, through the discords of the present, to the harmonies of the future; his thought has pierced through the crust of the surface, to the deep beneath; and now the time is come; he has seen,—he must show; he has heard,—he must tell; he has received,—he must give; in picture, or statue, or structure, or symphony, or poem, he imbodies his results; and in all these various forms of production, whatever be the character of their design, the aim of the earnest-souled receiver, is one;—that the thing produced shall be beautiful and true.

As the artist's work is similar, so is its purpose. Like the mountain stream, which, descending from the clouds of heaven, seeks, with a widening current, the boundless ocean whence its waters first exhaled, the true artist ever strives after that whole infinity of beauty and of truth, from a detached ray, as it were, of which his course of inspired action began. In the beginning of his career there was an extension of the infinite to him,—a revelation to his spirit of a beauty and a truth, newer in kind or higher in degree, than was before known or felt: from this his labors sprang; and the true tendency and end of them is to make what he thus knows and feels, known and felt; to open to his own and all others' eyes a wider and more perfect view of that glory which has glanced upon him; and in proportion as he has fulfilled this, shall his work endure. But this is not all:—

The ruling principles also of the several arts are identical: in the expression of the same quality or feeling, the same law of means obtains in all the arts, *i. e.*, the elements must be used after the same principles, and therefore the *laws of the fine arts* are deducible from *the principles* of ART, and may be considered as a polyglot version of art-law. If, therefore, we obtain a comprehensive knowledge of the principles and laws of art, we possess the key to the intelligence and application of the laws of the arts, which are its different branches. The aim of art, in all its branches, throughout its works, is, from variety of element, by harmony of combination and arrangement, to produce unity of effect; in fewer words, variety in unity.

It would free an artist from the pedantry—from the trammels of the technical, to acquire some knowledge of the arts which thus claim kindred with his own; and where there is original power, the mind, instead of being oppressed by its increase of attainments, will discover, or discern, more clearly, the common bearings and hidden analogies of the different branches of art, which will thus shed light upon each other. An architect for instance, would be a better architect from knowing someting of painting and sculpture,—while the painter and sculptor would find their advantage in an acquaintance with architecture—the principles of the three arts being the same, only differently applied. The architect need not be able to paint a picture or model a bust,—nor the sculptor or painter to design a mansion: but each should understand the great principles of the sister arts, and know how, or in what way, they are identical with those of his own, and be able to trace the analogy and relations of the various productions of genius. He does not thoroughly understand the principles of his own art, unless he sees their universal application. A study of the laws of art, generally, would not enable the same man to write an epic, compose an overture, and design a palace, but it would be attended with advantages sufficiently important in reference to the art to which he was devoted. It would lead him to see at

a glance to which of the arts any given subject was best fitted, and prevent a painter taking one that was more suited, or perhaps only suited to a poem; or a sculptor attempting to illustrate, by his chisel, one that required the superior resources of painting to express. Many failures have had their source in ignorance or inattention on this head. There are necessary limitations to each of the arts: their scope is various. Painting is more confined than poetry, and sculpture than either. Of the five several arts, poetry is the most excellent—the most comprehensive: the poet has the longest line, the widest range. Ideas can be expressed in poetry, that cannot be adequately expressed otherwise,—by any other of the arts. S. H.

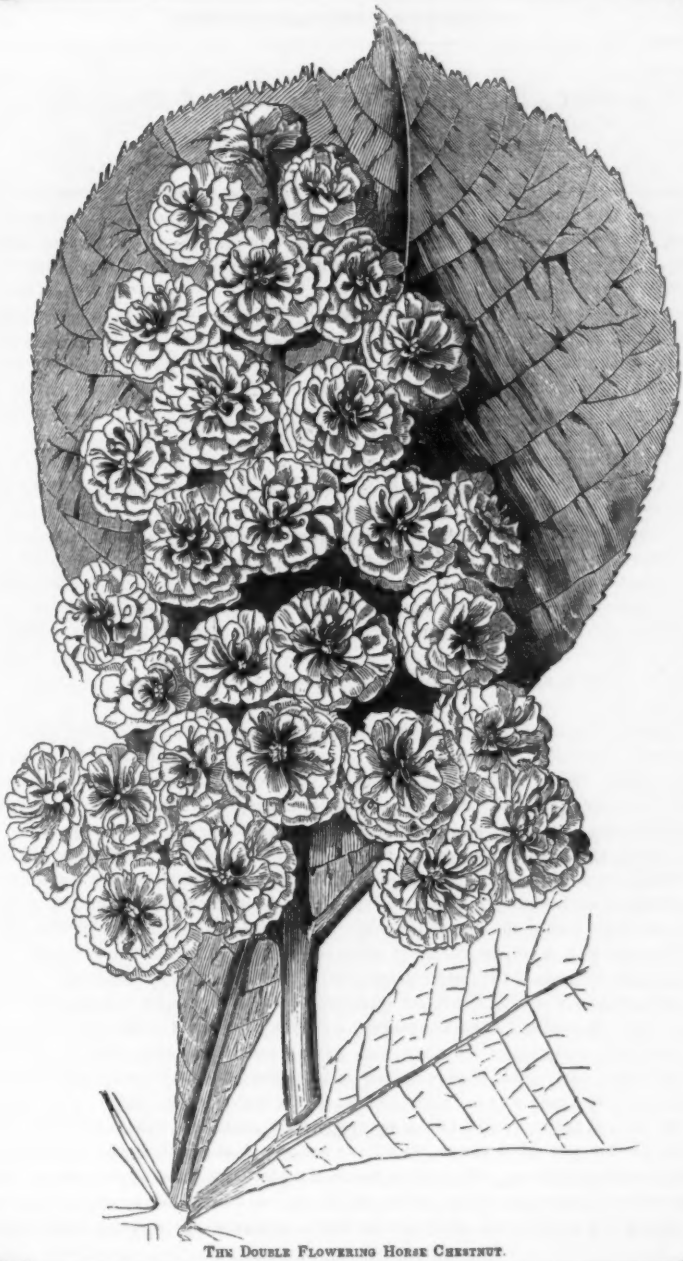
NOTICES OF NEW OR RARE PLANTS.

I. Fortune's Cape Jasmine.—(*Gardenia Florida*, var. *Fortuniana.*)—Very few green-house plants, introduced within the last five years, will bear comparison with this superb new Gardenia, brought from China by Mr. Fortune. In the first place, the plant is one of the finest green-house shrubs, with noble broad leaves, each four to six inches long. In the second place, the flowers, which are very large—of the size of the largest Camellia, resemble those of the double White Camellia, both in form and purity of color; and in the last place, they are deliciously fragrant. We notice that Messrs. Parsons & Co., of Flushing, advertise this unrivaled Gardenia for sale this autumn.

II. Large Red Escallonia.—(*Escallonia macrantha.*)—One of the most ornamental evergreen shrubs, a native of Chiloe—hardy about Baltimore, and likely to prove a most valuable "bedding-out" plant for the flower garden farther north. The flowers are borne in terminal panicles, are large and showy, and of a deep crimson red color. It blooms from June to October, most abundantly. The leaves are elliptical, and doubly serrated. "No garden where ornamental plants are esteemed"—says the periodical just quoted, "ought to be without this Escallonia. In Devonshire it is hardy. In a cold conservatory it would form a splendid bush, and moderate sized plants, grown in pots, would be very useful for purposes of decoration. It may be multiplied to any extent by cuttings of the young shoots, planted under hand glasses, in sandy soil; the young plants requiring the protection of a frame in winter."

III. The Slender Deutzia.—(*Deutzia Gracalis.*)—Those of our readers already in possession of that charming hardy shrub, the *Deutzia Scabra*, will welcome with pleasure a new, equally beautiful, and more *airy* species—with long white flowers, borne in slender panicles. This species, very lately introduced from Japan, grows about three feet high, with a slightly pendant habit in the branches—the leaves only about an inch long—the flowers a delicate paper white—blooming in May. It grows readily from cuttings, and delights in a rich light loam.

IV. The Double Flowering Horse Chestnut.—(*Aesculus Hippo. fl. pleno.*)—We do not know whether this rare and beautiful lawn tree may yet be had in this country, but it is grown for sale by Mr. Thomas Rivers, nurseryman, Sawbridgeworth Herts, England, who deals largely with America. The tree grows to a large size, and is much like the common horse chestnut, but when in bloom it presents a far more beautiful appearance, the flowers being so double as to resemble a good deal those of the double pink Hyacinth. The tree flowers when quite young, and is readily propagated by grafting on the common species. We copy the engraving from the Gard. Mag. of Botany.



THE DOUBLE FLOWERING HORSE CHESTNUT.

A CHEAP PIT FOR GREEN-HOUSE PLANTS.

BY AN ORIGINAL SUBSCRIBER, NEW-YORK.

DEAR SIR—I take it for granted that there are a good many among your readers, who, like myself, love gardens, and are too poor to have all the luxuries that belong to them. Among these luxuries I count green-houses and hot-houses. Now, as I dont spend fifty dollars a year on my garden, besides my own labor, it is not to be supposed that I have any such "Crystal palaces." Yet I contrive by the aid of cheap pits or frames, sunk in a dry warm part of my garden—under the south side of a board fence, to keep through the winter all the half-hardy plants, such as tea-roses, carnations, petunias, heliotropes, and most of the hard-wooded green-house plants that adorn the garden, and keep it gay in summer. Chinese Azaleas do even better in these pots, than they do in green-houses. To make such frames, it is only needful to choose a piece of ground that is well drained, to have a few good hot-bed sashes, to make a frame or bottomless box, out of some rough boards, as wide as the sashes are long, and as long as the sum total of feet that your sashes will cover if laid side by side. Sink the frame in the ground to its level, within two inches at the front, and three inches at the back, so as to make the needful slope to carry off the rain. Dig out the soil for two feet deep. Spread a couple of inches of small stones, or coal ashes at the bottom, and set the pots upon this. Give as much light and air as you can until severe frosty weather sets in. In downright winter weather keep the frames shut pretty close, covering the glass at night with several thicknesses of matting or old canvas bagging—and in very hard frost, with a few bundles of straw in addition. Water only when the pots appear somewhat dry—but then water freely—especially if the weather is such that you can keep the frame open for an hour or more.

In this way, almost all the popular and showy green-house plants may, as I have said, be wintered in excellent condition, at very trifling expense, no artificial heat, whatever, being required. Wishing, however, last winter, to do something new, and have a few really tender exotics in a pit, I hit upon a cheap and simple sort of warming apparatus, which succeeded quite to my satisfaction, and I must therefore describe it to you.

My heating apparatus was a large flat, tin lamp, with a common candle wick—the lamp large enough to hold a pint of alcohol—for this was to be my fuel. Over this lamp, at the distance of an inch and a half, was suspended or fixed my boiler—about six by eight inches, also tin. Out of the side of this boiler, about one-third of the way down, started a tin pipe, one inch in diameter, tightly soldered to the boiler, and also at every joint. This pipe ran quite round the frame, (suspended a little way from the board by a wooden bracket,) and finally entered the boiler again near the bottom, on the side opposite where it went out. The boiler itself was soldered quite tight, and the whole pipe was quite tight—with the exception of one place; this was the first elbow after it left the boiler—one-third of the way round. Here it had an upright joint soldered on, reaching up to near the glass—say two inches higher than the level of the water in the boiler. This upright joint was open at the top, and into this opening I daily poured the water to fill the boiler, pipe and all—for you see it was in fact all one boiler. I had then, as your readers well versed in hot-water heating, will see at a glance, a modern hot-water apparatus—on a miniature scale, at a very low price, such as can be made in a few hours by any tinman. Six pence worth of alcohol would carry my hot-water apparatus through the coldest night,

and warm the frame admirably, without any danger of over-heating, and in ordinary nights, (the frame being well covered,) I needed no fire. Soon after the lamp was lighted, the warm water began to rise in the boiler, and to flow off through the topmost pipe, and as it became cooled it returned to the bottom of the boiler, by the lower part of the same pipe—and although, of course, the water never became hot, it was quite warm enough, not only to raise the temperature of the frame, but to keep it raised—as the water once heated remained so a long time after the lamp went out.

I ought to add, that at the end of the frame, where the lamp was fixed, I had a little box, or double door, by which I could light and feed the lamp without letting cold air into the frame.

I have sent you this account of my simple experiments, which will appear insignificant enough to many of your readers, thinking that some few of those to whom "necessity is the mother of invention," might find a useful hint for their own practice.

Yours truly, AN ORIGINAL SUBSCRIBER.

New-York, September, 1851.

DESIGN FOR A PUBLIC SCHOOL.

[SEE FRONTISPIECE.]

IN accordance with our wishes, to see an improvement in the architecture of our school-houses, as expressed in previous numbers of this Journal, we present this month a design by Mr. CAVELER, an English architect, which will be found to present some points worthy of study, in the composition of this class of buildings.

The style is what may be called domestic Gothic, and in picturesque effect is only calculated to harmonise with rural scenery. It is to be built of brick, with stone dressings—a very substantial and excellent mode—and one which, in many parts of this country, would be comparatively economical.

The plan of this school-house embraces a double-school accommodation—one for boys, and another for girls. The total number of pupils provided for is four hundred. Each school-room has a class-room, a lobby for cloaks and hats attached to it, and a separate yard for play ground, in the rear.

Buildings for public instruction, if thus designed in a style calculated to awaken ideas of beauty, fitness and order in the minds of youth, would always help to educate the eye and the feelings in architecture, while like every other mark of civilization and refinement, they would insensibly elevate the character of all who are brought in contact with them. A boy may learn arithmetic as well in a log hut as in the most admirably proportioned building; but in the latter he will also be much more likely to learn something of the power of the nobler forms of mere matter, and their superiority over low and vulgar forms.

ON THE LIMITED DURATION OF VARIETIES OF PLANTS.

BY JOHN TOWNLEY, MOUNDVILLE, WIS.

A. J. DOWNING, Esq.—Dear Sir: I accede with pleasure to the request of your correspondent, Mr. MARSHALL, to state what grounds I have for subscribing to the theory advanced by ANDREW KEIGHT, respecting the limited duration of varieties of plants.

Before I proceed, however, I wish to set Mr. MARSHALL right on one or two points; he says that I condemn propagation by extension in comparison with seedlings; if what I have said should convey that meaning to your readers generally, some apology is due from me for the imperfect manner in which I must have expressed myself, for I certainly do not condemn propagation by extension; on the contrary, I consider that when once a valuable variety of apple, &c., is obtained from seed, that multiplying it by divisions of the stem is a perfectly legitimate mode of propagation, and one that should be practiced so long as the individual variety retains its health and vigor; but beyond that period—when a variety exhibits manifest symptoms of declining vigor, and has become diseased and unproductive, through age, then I consider it should no longer be propagated by division, nor should seeds be saved from it with a view to raise new varieties, seeing that it is probable that the health of the seedling plants would be influenced to some extent by the unhealthy and degenerate condition of the parent tree.

I may further remark that I am not prepared to prove "that trees and plants propagated by extension, do produce degenerate fruit from that very cause, and that alone." I am not aware of having said anything in the paper referred to, which will justify the conclusion that I entertain any such notions. In the matter of the potato, I stated what I believe to be the exciting and chief predisposing causes of the blight; I consider the potato to be in a condition different from that of any other cultivated plant; that considered in the mass, or as a species, it is hereditarily diseased; believing this, and knowing that it had been observed in the case of the pear, that seedlings raised from old, nearly worn out varieties, proved, as might reasonably have been expected, unhealthy, and liable to disease also; and knowing, moreover, that many varieties of potatoes recently obtained from seed, were subject to dry rot, and as much injured by the blight, as older varieties, I concluded that the best way to get rid of the hereditary taint, was to persevere in raising a succession of seedlings, with improved culture, selecting the strongest and healthiest plants each year, to be the parents of a fresh generation of seedlings in the year following. If seeds were saved from a healthy variety of fruit tree, or other plant, when in the prime of its existence, although the plant it was saved from had been propagated by extension, I know of no reason why the progeny should not be perfectly healthy. Nor is there any reason for believing otherwise, than that a species of plant whose varieties are propagated by extension, may not be continued equally healthy and vigorous forever, providing the successive generations of seedling varieties were always raised from seeds taken from plants when in a healthy and vigorous condition.

Now for my "hobby." Perhaps it may be well at the outset to state briefly the nature of the hypothesis we are about to consider. It is this. Vegetable life, like animal life, has its fixed periods of duration. A seedling apple tree, for instance, has its periods of youth, maturity, and old age. All cuttings taken from this seedling apple tree and grafted, are but the extension of an individual plant—one distinct variety, and the plants so propagated possessing the same constitution, properties and tendencies, and are not a re-

newal or reproduction, as by seed. They will all exhibit, (if we may so speak,) a sympathetic state of health, making, of course, due allowance for the action of adventitious circumstances; and although some plants, if placed in unusually favorable circumstances, may out-live the parent tree, yet there will come a time "beyond which the debility incident to old age, cannot be stimulated;" all plants of the variety will consequently become diseased and worthless.

A knowledge of this hypothesis is of importance to all cultivators, because if it is well founded, it shows to us the hopelessness of striving against nature, by persevering in the cultivation of varieties of plants when they have become aged and unhealthy, and no longer able to make an adequate return for the labor and attention bestowed on them. It shows also, the necessity of keeping up a succession of varieties from seed, and that it is an important matter to consider the age and health of a variety, when our object is to obtain from seed, new, improved, and healthy varieties.

In order that Mr. KNIGHT'S hypothesis may be better understood, generally, and that I may be better able to prove what substantial grounds it rests upon, I have thought it advisable to direct attention to the most recent and elaborate attack on it—viz: two articles of Prof. LINDLEY, in the Gardeners' Chronicle of December 13 and 20, 1845; for the value of a theory is made manifest not only by the accuracy of the facts on which it is based, or the soundness of the reasoning by which it is supported, but by the fallacy of the arguments by which it is assailed, more especially if the assailant is a man of acknowledged ability, and acquainted with the subjects on which he writes.

The opinion of systematic botanists generally, on horticultural matters,—I mean men whose lives have been chiefly devoted to the classification and description of plants, does not seem, so far as my experience extends, to be entitled to any very great weight. LINDLEY, however, is an exception—the son and brother of a nurseryman, Vice-Secretary of the Horticultural Society of London, and Editor of the Gardeners' Chronicle, he has enjoyed opportunities of obtaining a more thorough knowledge of the details of practice, and the history of cultivated plants, than any other man now living who possesses anything like the same amount of theoretical knowledge; and when, with these advantages, we consider that he wields the pen of a ready and plausible writer, it may be presumed that if any man were capable, by means of facts at present known, of proving that Mr. KNIGHT'S views on this point are erroneous, LINDLEY would assuredly be that man.

Possibly there may be readers of the Horticulturist not much acquainted with Mr. KNIGHT'S labors, and who may not, therefore, be able to appreciate the deference which is due to him as a patient, ingenious, and truth seeking inquirer. No one can better testify to his great merits than Dr. LINDLEY. In a memoir of Mr. KNIGHT, published in the Atheneum, Dr. LINDLEY, when alluding to his celebrated paper on the inheritance of disease in fruit trees, and other communications laid before the Royal Society, said, "in all these researches the originality of the experiments was very remarkable, and the care with which the results were given, was so great, that the most captious of subsequent writers have admitted the accuracy of the facts produced by Mr. KNIGHT, however much they may have differed from him in the conclusions which they drew from them. No man living, now before the world, can be said to rank with him in that particular branch of science to which his life was devoted."

One of the first subjects to which Mr. KNIGHT'S attention was directed, was the unhealthy condition of several old and famous varieties of the apple and pear; he was told by neighboring nurserymen that they could no longer raise healthy and profitable trees from them; that they were, in fact, worn out. Mr. KNIGHT was persuaded that this was

a vulgar error, and he commenced a series of experiments with the express view of proving it to be so. Instead, however, of holding an imaginary conversation with the old trees, after the fashion of your correspondent, Mr. MARSHALL, he allowed them to speak for themselves; he questioned and cross-questioned them, with an ingenuity and perseverance as trees were never questioned before, in the vain hope to shake their testimony and non-suit the nurserymen; but they told him plainly, repeatedly, and decisively, in a language not to be misunderstood, that their doom was sealed; that the vigor of youth, and the productiveness of mature age, had passed away; that they were no longer able to sustain their former labors, and nothing but increasing infirmities remained for them.

An account of his experiments in this matter, was the subject of his first communication to the Royal Society, in 1795, and in a communication to the Horticultural Society, in 1824, when his views had been subjected to much criticism and no small amount of ridicule, he stated that, "every experiment which seemed to afford the slightest prospect of success, was tried by himself and others, to propagate the old varieties of apple and pear, which formerly constituted the orchards of Herefordshire, without a single healthy or efficient tree having been obtained;" and what ANDREW KNIGHT, and other practical men, found by repeated experiments to be impracticable, no man, that I am aware of, has yet proved by experiments in the climate of England, to be feasible; and that, I apprehend, is an important fact which should not be altogether lost sight of in this inquiry.

"Of the apples mentioned and described by PARKINSON," Mr. KNIGHT says, "the names only remain; but many of EVELYN'S are still well known, particularly the Redstreak; we had many trees of it, but they appear to have been in a state of decay during the last forty years; others mentioned by him are in a much better state of vegetation, but they have all ceased to deserve the attention of the planter." Dr. LINDLEY does not attempt to deny these facts, but offers what we may presume he considers to be a more satisfactory explanation. Besides the main point at issue, three foolish propositions are gravely examined in these anticles, and as a matter of course, are very cleverly proved to be untenable. They are these: 1. It is alleged that seeds renew the languid vigor of a species as often as they are sown, and that if an unhealthy plant is multiplied by seeds, the immediate offspring becomes healthy. 2. It is also said that multiplication by seed is the only natural mode of propagation known among plants. 3. Seeds are said in all instances to produce healthy plants, but this, as LINDLEY truly observes, "like the previous assertions, will not bear exact investigation." As, besides Mr. KNIGHT, no other writer is referred to but myself, in these articles, I may, in case any readers of the Horticulturist should have access to the Gardeners' Chronicle, be allowed in self-defence to say, that these propositions did not emanate from me.

Dr. LINDLEY, in attempting to disprove the soundness of Mr. KNIGHT'S views, goes at once to the root of the matter, by boldly denying that vegetable, like animal life, has its fixed periods of duration: he says, "trees, and other wild perennial plants, have never yet been shown by any trustworthy evidence to be subject to decripitude arising from old age. On the contrary, every new animal growth is a renewal of their vitality. In the absence of disturbing causes from without, there is no intelligible reason why a forest tree should not continue to grow to eternity." If there be, indeed, no trustworthy evidence on record showing that trees become decrepid through age, the only conclusion that I should feel justified in arriving at, would be, that trustworthy authors must have considered it would be idle and superfluous to insist upon a fact which would seem to be so self-evident to every one who had ever enjoyed a woodland ramble. And as to every annual growth being a renewal of the vitality of trees, it is an annual transition from pas-

sive to active vitality, but it cannot be said to be a *renewal* of vitality, any more than the awakening of a dor-mouse, or other hybernating animal, can be said to be a renewal of its vitality. It is the same vitality throughout life, only differing in power as the measure of life progresses, and maintaining its ascendency for a longer or shorted period, according to the original vigor of the constitution, and to the favorable or adverse circumstances to which individuals may have been exposed. The periods of youth, maturity, and old age, are, indeed, sufficiently well marked in fruit and forest trees, and the changes induced by age have been observed and described by KNIGHT, LOUDON, and other writers, and may be briefly summed up. We find a tree in its youth grows with rapidity, exulting as it were, in its vigor and health; as it reaches maturity the exuberance of its growth is checked, and its energies are chiefly directed to the production of fruit or seed; as old age advances, the foliage is first seen to become meagre, blossoms are more seldom followed by fruit; the production of a moderate crop of fruit is followed by great exhaustion, from which the tree slowly recovers; the young shoots become more feeble and shorter; next, the extremities of the branches begin to decay; the fruit is now irregularly ripened, and of inferior quality; mosses, lichens and canker seize upon the wood; parasites infest the leaves; insects lend a helping hand in the work of destruction; birds hasten the work by searching and digging for the insects; water and air are thus introduced; thus all these various causes combine to reduce the aged tree to its kindred dust. All this may be admitted as true, yet it is contended that the decay and death of a tree are not a consequence of age, or diminution of vital power, but arise from external, not intrinsic causes. "The soil," LINDLEY says, "becomes exhausted, the roots wander into uncongenial soil, food is withheld, and the elements conspire against the doomed tree." Now, there are many trees and shrubs which propagate themselves considerably by means of suckers. "The Aspen," Mr. KNIGHT observes,* "is seldom seen without a thousand suckers arising from its roots; yet this tree is thinly, though universally, scattered over the woodlands of England." I can speak from experience, he adds, "that the luxuriance and excessive disposition to extend itself, in another plant, (the raspberry,) decline in twenty years from the seed." If the diminution of vigor which precedes decay was owing to external, and not to intrinsic causes, mainly, then the raspberry should go on and on, extending its circle each year, like the fungi of a fairy ring, never resting while there was any fresh soil to occupy, and the last plants should be as vigorous as the first; for surely it cannot be said that the diminution of the vigor of a plant which extends itself in this manner, can be owing to the external causes above mentioned.

In the same soil a gooseberry bush may live fifty years, an apple tree two hundred, a pear four hundred, and an oak one thousand. If external influences alone determine the existence of a tree, why this difference? Why does not the hardy gooseberry, growing under the same circumstances, live as long as the oak? It is because the influence which chiefly determines the existence of different species, is inherent, and not dependent solely upon external circumstances. And if it is the inherent vitality or constitutional power, which limits the duration of an individual tree, then, obviously, all cuttings taken from that tree inherit the same constitutional power and tendencies; and the healthy existence of the plants raised from the cuttings, must be nearly co-equal with that of the original tree, providing it died from the infirmities of age. The truth is, the same law prevails in the vegetable as in the animal kingdom. For wise purposes, different periods of existence are assigned to different species of plants, as well as to different species of animals; but it is obviously a law of nature, that none shall live forever. Some species of animals run

* Knight's Phys. and Hort. Papers, p. 84.

their course in a few hours or days, the life of others extends beyond a century, but the end of all is death. So of plants: some spring into existence, fructify and die within a week; the life of others is limited to five or six months; and so the period of existence gradually extends until we come to the monarchs of the forest, which may boast of a life of one thousand years and upwards. But because they have lived so long, are we then to conclude that there is no limit to their existence, that they form an exception to all other organic beings, and that they can never suffer decay through the infirmities of age? Most assuredly not. A more unwise or inconsistent supposition never entered into the mind of man. The lordly oak labors under the same irrevocable decree as the humble weed,—dust they are, and unto dust they must return.

As a set off to KNIGHT'S experiments on the apple and pear, some instances are cited by Dr. LINDLEY, of cultivated plants having been propagated by division a considerable time, without wearing out. The white buttery pears of France are said to have been propagated by division, from time immemorial, and exhibit no trace of debility. I am not acquainted with the history of the white buttery pears of France, and cannot, therefore, say what value is due to this statement. I may observe, however, that it is anything but satisfactory or conclusive evidence. French writers might with equal truth say that white heart cherries, or pink-eyed potatoes, had been cultivated in England from time immemorial. There are, and have been, however, many varieties of these plants known by these names; and as the duration of the pear is supposed to be somewhere about four hundred years, possibly this period, even supposing one variety only has been known to French writers under that name, is amply sufficient to constitute a "time immemorial." My desire, however, is to arrive at the truth, and if your knowledge of fruits, Mr. Editor, will enable you to confirm the accuracy of Lindley's statement, let him have the benefit of your knowledge.

Dr. LINDLEY further remarks, that "some vines which are *supposed* to have been in existence, in the days of COLUMELLA, have been transmitted by division to the present day." The fact that varieties of the vine had been propagated by cuttings a considerable time, was the chief reason advanced many years ago by LOUDON, to prove that Mr. KNIGHT'S views were erroneous, and when I considered the spirit in which the objections seemed to have been penned, and the extent of LOUDON'S knowledge of garden history, it tended in no small degree, to convince me that truth was on the side of Mr. KNIGHT; for even supposing the conjecture is true, that some vines of the present day are the same varieties mentioned by COLUMELLA, surely an impartial inquirer after truth, must be ready to confess that this seemingly formidable objection is, in reality, no objection whatever, seeing that the vine is one of the longest lived plants known; nay, so long will individual plants of the vine live, that LOUDON says, "the age which the vine will attain in warm climates, is so great as not to be known; it is supposed to equal or surpass the oak." If this be so, then there is obviously nothing improbable in the supposition that a plant of the vine living in the days of COLUMELLA might, if not destroyed by violence be living now; it is, therefore, perfectly consistent with Mr. KNIGHT'S hypothesis, that varieties of the vine mentioned by COLUMELLA, may have been continued by division to the present day. And yet because varieties of this long lived plant have been propagated by cuttings during centuries, we are required to believe that varieties of the potato, and other short-lived plants, propagated in like manner, do not wear out and become feeble in consequence of age, but that with due care, they may be made to live forever!* JOHN TOWNLEY.

* To be continued.

A NEW VARIETY OF PORTULACCA.

BY PROF. CHARLES G. PAGE, WASHINGTON, D. C.,

DEAR SIR—The varieties now cultivated of the Portulacca splendens, are four in number, viz: the *crimson*, the *scarlet*, the *white*, and the *yellow*. The white is subject to the freak, not uncommon in florist's flowers, of bearing different colored flowers upon the same stalk. Sometimes every flower will be a pure white, and occasionally two petals crimson, and two white; occasionally a dash of crimson in one or more petals, and so on. I have even seen a pure *crimson* flower, on the white variety. But the yellow has, for the three seasons I have raised it, been pertinaciously yellow, although I have made many attempts to cross it with the crimson and scarlet. I have at last succeeded in obtaining a new and exceedingly beautiful variety between the crimson and yellow, and what is quite interesting, it has occasionally a pure crimson flower upon the same stalk. It has not yet borne a pure yellow, though by analogy it should. Thus far, the mixed flowers have the yellow and crimson nearly equally distributed, the crimson generally predominating a little. Two petals are generally crimson, and two yellow, slightly spotted or dashed with crimson. The different colored petals are sometimes opposite and sometimes in pairs.

C. G. P.

Washington, Sept. 1, 1851.

Foreign and Miscellaneous Notices.

INFLUENCE OF GYPSUM ON VEGETATION. By M. C. MENE.—Ever since Franklin's great experiment, gypsum or sulphate of lime has generally been considered as possessing much fertilising power, and of being of great importance in agriculture. Having paid some attention to this substance, I make known my results, in the hope that they may be found of value to the public.

1. I filled two zinc boxes with pure sulphate of lime obtained from the double decomposition of sulphate of soda and chloride of calcium; in one of these boxes I sowed some grass seeds, in the other some wheat. The two boxes were then placed under glass shades, in order that all external influences might be avoided: the seeds were watered every other day. At the end of a few weeks plants had come up green and healthy, as in common soil; but as they developed, their fine appearance diminished, and at the end of a fortnight they looked dried and withered.

2. In boxes similar to the first, I placed a mixture of equal quantities of pure sulphate of lime, obtained as before, and clay, and sowed the same seeds as in the last experiment; the plants came up, but not nearly so well as in an unartificial soil, and they did not ripen.

3. In boxes, and under circumstances the same as before, I sowed the same seeds on dung covered over with a layer of sulphate of lime three-tenths of an inch deep. At the end of a fortnight the plants had come up and grown wonderfully; they ripened well and were magnificent specimens.

These facts, though of considerable practical importance, would not have shown in what way sulphate of lime really acts, had it not been for the following accident:

Happening to have a glass of muriatic acid in my hand one day, when looking at box No. 3, I accidentally spilled some of the acid on one of the boxes, and to my great surprise the lime effervesced, and on further examination I was satisfied that the sulphate had become changed into carbonate of lime. I concluded from this fact that the carbonate of ammonia, given off by the decomposition of the dung, being volatalised by the heat of the sun, came in contact with the sulphate of lime, when double decomposition ensued.

To ascertain how far this was true, I got some zinc pots, with bottoms pierced like a sieve; in the pots I placed some dung, then some sulphate of lime, and then I sowed some grass seeds.

When the plants had appeared and become tolerably developed, I watered them abundantly for a quarter of an hour, and in

the liquid which flowed from the bottom of the pots I found sulphate of ammonia, whilst on the surface of the pots there was evidently carbonate of lime. This confirmed the view I had adopted.

I then made other experiments, which do not, however, bear upon the last mentioned facts. For example, I watered grass seeds sown in manure, in pots with pierced bottoms, with water containing one of the following substances, viz: sulphuric acid, muriatic acid, nitric acid, acetic acid, sulphate of iron, sulphate of potash, chloride of manganese, phosphate of soda, sulphate of magnesia, nitrate of soda.

With all these substances the grass grew well, and from the bottoms of the pots I obtained salts of ammonia, which are not volatile at the ordinary temperature. From all these facts I think we may conclude—

1. That gypsum has by itself no fertilising power, and is alone useless as a manure.

2. That gypsum only is useful in agriculture when mixed with substances containing ammonia; in which case there is a double decomposition, and the ammonia is stored up for the use of the plants.

3. That for gypsum may be substituted any other salt which will fix ammonia, and render it not volatile at the ordinary temperature.

It is my intention next year to repeat these experiments on a large scale, in order to ascertain their real practical value.—*Comptes Rendus.*

Method of Preserving young Fruit Trees from the attacks of Hares and Rabbits.—All lovers of gardens know by experience that hares and rabbits devour with great avidity the annual bark of young fruit trees, and particularly of dwarf apple trees, among which the most healthy and vigorous are always destroyed the first, in consequence of their bark being the most tender and savoury. As soon as the ground is covered with snow, these animals, no longer finding anything in the fields on which they can browse, begin their devastations in the gardens: if they are numerous, and the fall of snow heavy, a few nights only are sufficient for them completely to ruin the most beautiful plantation, and to annihilate the result of many years of labor and care. Happily, nothing is more easy than to place these trees beyond the attacks of these marauders protected by the law. The following is the plan I have adopted with complete success during the last six or seven years. I mix about 4½ pounds of quick-lime, in lumps, with 2¼ gallons of water, and add a few handfuls of soot, stirring the liquid until the two substances are intimately incorporated. I then take a handful of Rye-straw and bind it on a stick to form a kind of brush, with which I grey-wash the trunk and branches of my trees from the ground to at least a yard above it; for should the snow drift by the wind against the foot of the trees, the hares, by means of the inclined plane thus afforded them, would be able to attack the trees at a much greater height. The wash, applied hot, has also the advantage of preserving the bark of the trees in a state of perfect health, and preventing the increase of moss, which is often pernicious in its effect, and always very disagreeable to the eye. It is desirable that this preservative application should be made in dry weather, in order that the mixture on drying may adhere to the bark; for should it rain at the time, or immediately afterwards, the mixture would be washed from the trees, and it would be necessary to re-commence the operation. If the mixture also is applied during a frost, there would be little chance of perfect success; as the part of the bark on which it would be laid would be thawed. If, however, through want of foresight, a frost sets in during the course of the operation, and it becomes urgent to complete it, we may do so with perfect success by choosing that moment of the day in which the sun strikes most strongly with his rays the trees on which we wish to operate. Three gallons of this wash are sufficient to secure two or three hundred dwarf trees from the ravages of hares; a result that may be obtained for a pennyworth of lime and the day's work of an active laborer. This plan is equally infallible for the preservation of grafts and all nursery collections. *From the French of the Baron Vander-Strœten (in the Journal Agricole de Verviers.)*

The Glycine Sinensis—where it is found wild.—Before the last war with China, foreigners were confined to narrow limits about Canton and Macao, where they had no means of knowing anything of the more hardy plants of the north, which they sometimes met with in gardens, and introduced to Europe. Now, however, we can prosecute our botanical researches in a country which is nearly a thousand miles further to the north-east, and at many other places which lie along that line of coast. The island of Koolung-su, for example, near Amoy, was taken by our troops during the war, and occupied by them for some years, according to treaty,

until a portion of the ransom money was paid. It seemed to have been a place of residence to many of the mandarins and principal merchants in peaceful times, and boasted of its gardens and pretty fish ponds. When I first saw these gardens they were mostly in a ruinous condition, and everywhere exhibited the fatal effects of war. Many beautiful plants, however, still continued to grow and scramble over the walls. Captain Hall, of the Madras army, who was stationed there for some time, was very fond of botany, and took great pleasure in pointing out to me all the plants which he met with in his rambles. "I have good news for you," said he, one morning when I met him; "come with me and I shall show you the most beautiful plant on the island, which I have just discovered. It is a creeper, it produces fine long racemes of lilac flowers before it puts forth its leaves, and it is deliciously fragrant." What could it be? was it new? would it produce perfect seeds? or could young plants be procured to send home? were questions which rapidly suggested themselves. It is only the enthusiastical botanical collector who can form an idea of the amount of excitement and pleasure there is when one fancies he is on the eve of finding a new and beautiful flower. Captain Hall led the way, and we soon reached the spot where the plant grew. There had been no exaggeration in his description; there it was, covering an old wall, and scrambling up the branches of the adjoining trees; it bore long racemes of Pea-shaped flowers, and scented the surrounding air with its odors. Need I say it was the beautiful Glycine. But it was not found in a wild state even at Amoy, and had evidently been brought from more northern latitudes.

When I reached Chusan, in latitude 30° north, I found a remarkable change in the appearance of the vegetation. Tropical forms had entirely disappeared, or were rarely met with. Although the summers were as warm, or even warmer, than they were in the south, yet the winters were nearly as cold as those we have in England. On this ground, and all over the provinces of Chekiang and Kiangnan, the Glycine seemed to be at home. It grew wild on every hill-side, scrambling about in the hedges by the footpaths, and hanging over and dipping its leaves and flowers into the canals and mountain streams.

But by far the most beautiful effect is produced when it attaches itself to the stems and branches of other trees. This is not unfrequent in nature, and is often copied by the Chinese and introduced into their gardens.

You can scarcely imagine anything more gorgeous or beautiful than a large plant of this kind in full bloom. Its main and larger branches are entwined round every branch and branchlet of the tree; and from them hundreds of small ones hang down until they nearly touch the ground. The whole of the branches are covered with flower-buds, which a day or two of warm weather brings rapidly forward into bloom. To form an idea of the effect produced by these thousands of long lilac racemes, you must imagine, if you can, a floral cascade, or a Weeping Willow covered with the flowers of the Glycine. There are some large specimens of this kind on the island of Chusan. One, in particular, was most striking. Not content with monopolising one tree, it had scrambled over a whole clump, and formed a pretty arbor underneath. When I saw it last, it was in full flower, and had a most charming appearance.

The Chinese are fond of growing the Glycine on trellis-work, and forming long covered walks in the garden, or arbors and porticos in front of their doors. In a former letter I noticed a large specimen of this description in the garden of the British consulate at Shanghae. There is another remarkable one in the garden of a mandarin at Ningpo; growing in company with it is the fine new variety introduced lately by the Horticultural Society of London, and published in the Journal of the Society. In foliage and general habit the two kinds are nearly alike, but the new one bears long racemes of pure white flowers. The kind old gentleman to whom the garden belonged (he is dead now) allowed me to make layers of this plant on the top of his house, and during the summer months, when I was travelling in other districts, attended to them and watered them with his own hands. When I saw him about a year ago he told me he was then nearly 80 years old. One of the gentlemen who accompanied me (Dr. Kirk, of Shanghae,) being introduced to him as a medical man, was asked if he could live for one year more. The old man said he knew he must die soon, but he was most anxious to live for another year. His presentiment was but too correct, for the next time I visited Ningpo, about six months after, I found the door of the mansion bricked up, and the garden neglected and overrun with weeds.—*Gardeners' Chronicle.*

Domestic Notices.

PEARS RUNNING OUT.—Any person conversant with fruit, who will take the trouble to walk through the markets of Philadelphia—where more Seckel Pears are to be seen than any where else in the world, cannot but be struck with the very small size of these pears. If he has besides, been in the habit, as we have been, of seeing the Philadelphia markets at this season, for some years past, he will make the comparison between the Seckel Pears of Philadelphia now, and those of ten or fifteen years ago. Then, the Seckel Pears might be seen by the waggon load, large, fair, ruddy and handsome, as well as delicious. If you mention this present degeneracy to a Philadelphian, he will shrug his shoulders, and say, "yes, the Seckel Pear is no longer what it once was; I am afraid it is running out."

And yet, if you go to Boston—which is far from being so favorable a climate for fruit culture, as that of Philadelphia, you will see Seckel Pears so large and fine that you almost doubt their being the same fruit. If you are curious to investigate the history of the Seckel Pear culture in the two places, you will not long be at a loss how to account for the difference. In Philadelphia they trust to nature, and a soil once highly fertile. But the Seckel pear trees have exhausted the soil—because it had only a certain amount of pear tree elements, and languished for more food. In Boston they know that nature is a hard mother, and they rely on art—trenching the soil twice as deep as nature makes it, and supplying an abundance of food for the growth of the tree and fruit. Hence the average size of the Seckel Pear in Philadelphia, has dwindled down in twenty years, from an inch and three-fourths in diameter, to a little more than an inch—while in Boston, it has been raised by high culture, to between two and three inches in diameter.

Some soils, however, contain in themselves an almost inexhaustible supply of natural food for fruit trees. Even long culture wears out such soils slowly—because the mineral elements of fertility gradually decompose, and form new soil. We have before us a couple of Seckel Pears, of extraordinary size and beauty, sent us from Brandon, on the James River, Virginia, one of the largest and oldest estates in America—having been cultivated since the earliest settlement of the country. This estate still shows large fields, which, under the present good management—(i. e. the judicious application of lime,) yield 30 bushels of wheat to the acre. But the Seckel pear trees here, without any special attention, still bear larger and finer fruit than we have seen in Philadelphia. It is useless, with such proofs of the effects of soil and culture upon fruit, for our Philadelphia friends to talk about the "running out" of so modern a pear as the Seckel. It is the soil which has run out, not the variety. ———

GUANO.—Nothing is more pleasant than to give advice which, when applied to practice, affords satisfactory results. A year ago a friend complained of the high cost of stable manure. We recommended guano—which, at 2¼ cts. per lb., cannot but be considered a cheap manure. "Ah, but," said he, "it does not suit either our climate or our soil." When do you apply it, we asked him. "In the months of April or May, when planting my crops, or working my garden borders." It is precisely on that account, we answered, that in your dry soil and our dry climate, you have failed to get good results. Now make another trial in the months of October or November. Apply guano to garden or orchard soils that want enriching, at the rate of 500 lbs. per acre. The soil should be *lightly* stirred afterwards, to bury the guano, and fix it.

He followed our advice—not only in his garden and orchard, but in his meadows. In the latter he sowed it broad-cast, like plaster, while in the garden he spread it over the ground while ridging it up for winter. This season he had better growth of vegetables and grass, and larger fruit, than for many years past, and he attributes it very justly to the action of guano applied in the autumn—when it has time to impart its fertilising properties to the soil, in which they become completely incorporated before the next season's growth commences.

Save The Dead Leaves.—Very few gardeners would be guilty of so foolish a thing as to waste barn-yard manure. But they are almost all guilty of a waste not a whit less excusable. We mean the waste of dead leaves that fall at this season of the year, from trees and shrubs of all kinds. If every horticulturist would reflect for a moment on the nature of these fallen leaves—which contain not only the vegetable matter, but the earthy salts, lime, potash, &c., needed for the next season's growth—and that too, exactly in the proportion required by the very tree or plant from which they fall—nay more, if they would consider that it is precisely in this way, by the decomposition of these very falling leaves, that nature enriches the soil, year after year, in her great forests, it would scarcely be possible for such a reflecting horticulturist to allow these leaves to be swept away by every wind that blows, and finally be lost altogether.

A wise horticulturist will diligently collect, from week to week, the leaves that fall under each tree, and by digging them under the soil about the roots, where they will decay and enrich that soil, provide in the cheapest manner, the best possible food for that tree. In certain vineyards in France, the vines are kept in the highest condition by simply burying at their roots every leaf and branch that is pruned off such vines, or that falls from them at the end of the season. In the same manner, the leaves that fall from young fruit trees should be carefully saved and dug-in beneath the surface of the soil. A single year's experience of its good results will confirm our readers in this practice.

Some Autumn Hints.—Dear Sir: I send you a few hints for the management of the garden in autumn, which may perhaps be useful to your readers.

1. Carnations.—A frame of boards—an old hot-bed frame covered with glass and a few boards, is all that is needful to keep Carnations through the winter. The plants should be taken up—the new layers I mean, and carefully potted in a mixture of old decomposed manure, sand and loam; the pots set on some coal ashes spread over the bottom of the bed. So long as the weather is warm and mild, give a good supply of water whenever the soil in the pots appears the least dry, and keep the frames open. When the frost sets in, water more sparingly—but give air as often as you can. During the winter, keep the glass covered with boards for a good part of the time—especially if the soil in the pots is frozen. The great point is to keep the plants perfectly dormant and quiet during the winter, and for this purpose you only open the bed to the sun when the weather is fine, and there is not a particle of frost in it—all the rest of the time you keep it shaded well with boards, admitting the air in at one end—or both ends. As spring opens, you gradually open the plants to the sun, and commence giving them more water. About the 10th of April you plant them out in the bed where they are to bloom. I ought to add to this simple practice, that the rats and mice are very fond of Carnations, and it will be wise to keep a little arsenic and meal on boards, at the bottom of the beds, that they may get their deserts.

2. Dahlias—Many lose their Dahlias from too much care in preserving the roots. The following is my mode, pursued with success for years. I take up the plants as soon as the frost has blackened the tops—

choosing a clear windy day for the purpose. I cut off the stalk an inch above the surface of the ground. After the roots are taken up, carry them to an airy loft or out-building, where they will be secure from frost for several days. Here allow them to stand quite separately, till the particles of soil that may adhere to them appear perfectly dry; better still if the the roots are turned over once, so as to become ripe and dry on all sides. Then take them into a dry cellar that will keep potatoes well, and lay them in a single tier on a floor, or on shelves, covering the roots lightly with *dry* tan.

3. Manuring Fruit Trees.—This is the season for the amateur to look over his fruit trees—especially those which have failed to produce good crops for want of nourishment in the soil. Carefully open a trench at the very ends of the roots—throw out a third of the poorest of the soil, and replace it with a mixture of manure and ashes. I use a cart load of barn-yard manure—no matter if it is fresh—to a bushel of ashes, and I find it never to fail in bringing up the tree. If I wait till spring before I apply this stimulus—I find it to do just half as much good as if I put it in the soil in October and November. It is quite surprising how old fruit trees can be brought to by this simple dressing—barn-yard manure and ashes, applied in the fall of the year. Some persons are too indolent to do it, but I think I can prove to them that it will "pay." On one side you have an enfeebled tree; it bears a peck of poor fruit, half of which is not fit to take to the table. It costs you nothing per annum—profit about equal to cost. On the other side you have the same tree—you give it two cart loads of manure—two bushels of leached ashes—once in three years, cost one dollar—and receive two bushels of fine fruit per annum, for three years,—value, three dollars a year, nine dollars—profit eight dollars! Very respectfully yours, A. T. *Chester Co., Pa., Sept.* 1851.

The Rot in Grapes—Dear Sir: As many cultivators of the native grapes suffer from the "rot"—a disease that makes its appearance by a small discolored spot on the berries, that frequently spreads till it destroys the whole bunch, and sometimes greatly injures the entire crop, I beg leave to say that this disease is capable of being kept under by careful hand-picking.

Having been more or less troubled by the the appearance of this disease in my vineyard for several summers past, I ventured to attempt to eradicate it by the following means. As soon as the rot season commenced—say the first of July, I employed a man to go carefully over the vines, and with a small pair of scissors, cut out every bunch that was in the least degree affected. These grapes were taken and buried in a lime heap—where I got them out of the way, and will I trust, turn them into compost. The man spent a morning every week in going over my vineyard of two acres, and the cost of his time so employed is exactly six dollars and fifty cents. *Per contra*—I have few or no bunches with the rot in my vineyard—on the other hand, I have an excellent crop of fine grapes—while my neighbors, who have only trusted to providence and the season, are much afflicted with the rot. If you think this experiment of any value, the foregoing is at your service. An Ohio Reader.

Dr. Comstock's Aquarium.—Dear Sir: In my description of Dr. Comstock's aquarium, I forgot to mention that the box should be placed *in the ground*, as it would otherwise burst by freezing, and be destroyed. The Doctor covers his in the fall with boards, to prevent injury by excess of water and frost. Yours, A. S. Monson. *New-Haven, Sept.* 12, 1851.

Fruit Culture in the United States.—Our cotemporary, Mr. Barry, of the Genesee Farmer, who has been spending the summer abroad, from whence he has written the best letters that have appeared in the agricultural journals, on the matters relating to the Exhibition, has given his read-

ers the following comparison of the horticultural advantages of both sides of the water. Looking at the matter in so far as relates to fruit and farm culture—we entirely agree with him—but for ornamental gardening, no climate equals England.

"In regard to fruit culture, our advantages are still greater. An orchard of fruit trees in this country, even when well attended, does not require as much care and labor in five years as it does in one in the greater portion of Europe. A single peach tree in England or France, receives more actual hard labor in one season, than an orchard of one hundred trees in Western New-York; and the price of a single fruit, or at any rate half a dozen, in the markets of London, or Paris, will buy a bushel in New-York or Rochester. We complain of curculio destroying our plums and apricots, and this is one of our greatest drawbacks here, but, notwithstanding, I have seen more plums and apricots on a single tree here since I returned, than on any dozen I saw in England. We have the aphis on our cherry trees here, but they are easily destroyed. In both France and England I saw both orchards and nurseries of cherry trees almost ruined by them, and they were said to be unconquerable. We have fire blight, and leaf blight here, and both are sad difficulties, but in France and England they are not without both these maladies. I saw apple trees very seriously affected in England, with what we designate fire blight,—the ends of the branches black and dead, and there, as here, the real cause is quite unknown to the most skillful cultivators. In France I saw as bad cases of our leaf blight on the pear, as I have ever seen in America. The ravages of birds in Eurore are tremendous. It is almost impossible to save a crop of cherries. Nets, scarecrows, and a thousand expensive and troublesome devices are practiced, that in this country, where labor is dear, would not be attempted, even though the culture should be abandoned.

"Fruit stealing has been supposed to be peculiarly an American vice, but it is not so by any means, though, probably, quite as prevalent as elsewhere. In other countries fruit gardens are better protected than in ours, and this gives them a greater degree of safety: but in France I saw several nurseries at some distance from houses, where the fruits were removed as soon as they appeared, to save the trees from being broken by the fruit stealers. If in America we were to apply ourselves to culture with the same indefatigable perseverance, the same regardlessness of labor that I have seen in Europe, we could produce results that we do not now dream of, and we will come to this by and bye—we are every year approaching it nearer and nearer—our culture is becoming more skillful, more thorough and more successful; but we have only made a beginning.

"In Horticulture, as in Agriculture, the United States of America has a great destiny to fulfil. Our territory is not only immense, but so diversified in soil and climate, that all the most valuable grains and fruits can be produced in such abundance as will enable us to supply other countries less favored in these respects. The intimate connection now established between all parts of the world, has removed the barriers which distance heretofore created, and we have now a clear course. Cultivators may redouble their energies with a sure prospect of reward, and if our government, in its wisdom, should see fit to lend a helping hand, all the better."

Osage Orange Hedges.—The Osage Orange is growing in favor as a hedge plant. Though the ends of the shoots are, in New England, liable to be nipped by the winter while the plant is young, it grows more hardy with age and clipping till it becomes quite acclimated. Wherever the peach ripens, the Osage Orange will make a good hedge. The following remarks from the Boston Cultivator are interesting in a practical sense:

Mr. Editor—In a late number of the Cultivator, one of your correspondents requests me to give my mode of cultivating the Osage Orange as a hedge. I commenced in April, 1848, with three pints of seed, sown in drills a foot distant from each other; hoeing and weeding them well. In the Spring of 1849, I planted 350 yards; dug the trench 18 inches deep, and where the land was poor, spread earth at the bottom that was collected from the wood pile, planted the sets at eight inches apart, and cut them off two inches above the ground. Each plant sent up from two to three shoots, which attained a height of five or six feet that season. The first summer I kept them free from weeds, and made the ground mellow by repeatedly hoeing and digging with the spade, and in the spring of 1850, I cut them down to one foot from the ground, cultivating as before. In July, I again cut them down to two feet, and in Sept. trimmed them again.

In the present year, 1851, they did not require any cultivation. July 10th, the hedge was from seven to eight feet high, when I trimmed and shortened to three feet six inches. The hedge is now 30 inches in width, and so thick that a small bird cannot fly through it, while the winter does not appear to affect it. I trimmed the 350 yards in three hours, and a boy put the bush in heaps in one hour, ready for burning. I have not discovered any enemies except the mole, and it has never appeared since the first spring. I have now 750 yards growing, all of which assumes a very healthy appearance.

Mr. Wilkinson's objections were, I believe, but not having the No. of the Cultivator at hand, I speak from memory, First: "The impoverishing of the land to 20 or 30 feet on each side of the hedge." Now I have not discovered any injury from mine as yet, and do not apprehend any more, than I should from the common thorn of the same height; but I was told by Mr. Solon Robinson, that "on the prairies of Illinois, where they grow without being trimmed, they impoverish the ground 10 feet on each side of the hedge;" and thorns will do the same if not kept trimmed. I keep my common thorn hedges down to four feet high, with a bank along-side, and the grain and grass is as good within a foot of the hedge, as it is elsewhere. Second objection, "that horses would not approach sufficiently near while ploughing, &c." This we consider their greatest merit; we do not desire hedges, that horses and cattle can at pleasure eat, trample upon, and destroy; we can plough within half the length of the single tree, say about two feet, and that is near enough to approach any hedge with the plough. Third objection, the expense in trimming; you can perceive by the above, that by taking the hedge in time, it is but a very easy day's work to trim the 750 yards; but as a matter of course, when the hedge becomes larger and older, it will require a longer time to perform the same work. I conclude by saying, I like the osage much better than the common thorn, and they form decidedly the cheapest fence that can be made, as those that were planted first in the spring of 1849, are now a good fence, and capable of turning horses and cattle, with the exception of a few that are planted under shade trees, where they are not quite so large and strong. BRYAN JACKSON. *Bloomfiled, Del.*

REGISTER OF NATURAL HISTORY.—The Smithsonian Institution, being desirous of obtaining information with regard to the periodical phenomena of animal and vegetable life in North America, respectfully invites all persons who may have it in their power, to record their observations, and to transmit them to the Institution. The points to which particular attention should be directed, are the first appearance of leaves and of flowers in plants; the dates of appearance and disappearance of migratory or hybernating animals, as Mammalia, Birds, Reptiles, Fishes, Insects, &c.; the times of nesting of Birds, of moulting and littering of Mammalia, of utterance of characteristic cries among reptiles and insects, and any thing else which may be deemed noteworthy.

A list of plants is appended, to which particular reference should be had in making observations. It has been prepared from materials furnished by Dr. John Torrey and others, and will be found to contain many species distributed throughout the United States, together with a number indigenous to, or cultivated in Europe. For the present, attention may be paid alone to the time of flowering of these species, this period in all cases being indicated by the first appearance of the anther in the expanding flower.

The Smithsonian Institution is also desirous of obtaining detailed lists of all the animals and plants of any locality throughout this continent. These, when practicable, should consist of the scientific names, as well as those in common use; but when the former are unknown, the latter may be employed. It is in contemplation to use the information thus gathered, in the construction of a series of tables, showing the geographical distribution of the animal and vegetable kingdoms in North America.

List of Plants to be particularly observed.

Acer rubrum, L., Red or soft maple.
—— pseudo-platanus, L., European sycamore.
—— saccharinum, L., Sugar maple.
Achillea millefolium, L., Millefoil or yarrow.
Actea rubra, Willd, Red baneberry.
—— alba, Bigelow, White baneberry—necklace weed;
Asclepias (syriaca) cornuti, L., Milkweed.
Æsculus hippocastanum, L., Horsechestnut, (fruit rough and prickly.)
—— glabra, Willd., Ohio Buckeye, (fruit rough and prickly.)
—— pavia, or flava, Ait., Yellow buckeye; (fruit smooth.)
Ailanthus glandulosus, Tree of heaven.
Amelanchier canadensis, Torr. and Gray, Shad bush, serviceberry.

Ampelopsis quinquefolia, Michx., American ivy—Virginia creeper.
Alisma plantago, L., Water plaintain.
Amygdalus nana, L., Flowering almond.
Anagallis arvensis, L., Pimpernel, Poor man's weather glass.
Anemone nemorosa, L., Windflower; wood anemone.
Aplectrum hyemale, Nutt., Putty root, or Adam and Eve.
Apocynum androsæmifolium, L., Dogbane.
Aquilegia canadensis, L., Wild columbine.
Amaryllis atamasco, L., Atamasco lily.
Arethusa bulbosa, L., Arethusa.
Arum triphyllum, L., Indian turnep.
Aristolochia sipho, D'Her., Dutchman's pipe.
Azalea nudiflora, L., Common red honeysuckle.
Bignonia (Tecoma) radicans, Juss., Trumpet creeper.
Catalpa bignonioides, Walt., Catalpa tree.
—— Indian bean.
Caltha palustris, L., Marsh marigold.
Carpinus americana, Michx., Hornbeam, iron-wood.
Celastrus scandens, L., Bitter sweet, wax work.
Convolvulus purpureus, L., Common morning glory.
Cercis canadensis, L., Red bud; Judas tree.
Chelidonium majus, L., Celandine.
Chionanthus virginica, L., Fringe tree.
Cimifuga racemosa, Ell., Black snake root; rattle snake root.
Claytonia virginica, L., Spring Beauty.
Corchorus japonicus, Yellow rose; (flowers all the year.)
Cornus florida, L., Flowering dogwood. (The time of expansion of the real flower, not of the white involucre.)
Cratægus crus-galli, L., Cockspur thorn.
—— coccinea, L., Scarlet fruited thorn.
—— oxycantha, L., English hawthorn.
Cynoglossum officinale, L., common hound's tongue.
Dentaria laciniata, Muhl., Cut leaved tooth-wort.
Dicentra cucullaria, D. C., Dutchman's breeches.
Digitalis purpurea, L., Purple fox-glove.
Draba (Erophyla) verna, L., Whitlow grass.
Epigæa repens, L., Trailing arbutus; ground laurel.
Erythronium americana, Smith, Dog tooth violet, or adder's tongue.
Geranium maculatum, L., Cranesbill.
Gentiana saponaria, L., Soapwort gentian.
Gleditschia triacanthos, L., Three thorned acacia, honey locust.
Gillenia trifoliata, Mœnch., Indian physic.
Gymnocladus canadensis, Lam., Kentucky coffee-bean tree.
Halesia tetraptera, Willd., Snow-drop tree.
Hepatica triloba, Chaix., Round lobed liver-wort.
Houstonia cœrulea, Hook, Bluets, innocence, &c.
Hypericum perforatum, L., St. John's wort.
Hydrangea arborescens, L., Wild hydrangea.
Iris versicolor, L., Large blue flag.
Juglans regia, L., English walnut.
—— nigra, L., Black walnut.
Kalmia latifolia, L., Mountain laurel.
Lamium amplexicaule, L., Dead nettle
Laurus benzoin, L., Benzoin odoriferum, Nees., Spice bush, Benjamin bush.
Lappa major, (Arctium lappa,) Gærtn., Common burdock.
Ligustrum vulgare, L., Common privet.
Lobelia cardinalis, L., Red cardinal flower.
Lonicera periclymenum, L., Foreign spurs.
—— sempervirens, Ait., trumpet honeysuckle.
Lonicera tartarica, L., Foreign spurs.
Linaria vulgaris, Mill., Common toad flax.
Lupinus perennis, L., Wild lupine.
Lilum philadelphicum, L., Wild lily.
Liriodendron tulipifera, L., Tulip tree, American poplar.
Magnolia glauca, L., Small or laurel magnolia, sweet bay.
Morus rubra, L., Red mulberry.
Nuphar advena, Ait., Yellow pond lily, splatterdock.
Nymphæa odorata, Ait., Sweet scented water lily.
Orontium aquaticum, L., Golden club, never-wet.
Oxalis violacea, L., Violet wood sorrel.
Platanus occidentalis, L., Buttonwood, sycamore.
Persica vulgaris, L., Peach.
Lodophyllum peltatum, L., Mandrake, May apple.
Pentstemon pubescens, Sol, Downy pentstemon.
Pontederia cordata, L., Pickerel weed.
Populus tremuloides, Michx., American aspen.
Pogonia ophioglossoides, Nutt, Adder's tongue.
Ptelea trifoliata, L., Shrubby trefoil.
Pulmonaria (Mertensia) virginica, D. C., Lung-wort.
Pyrus communis, L., Common pear tree.
Pyrus malus, L., Common apple tree.
Quercus alba, L., White oak.
Rhamnus cathartica, L., Common Buckthorn.
Rhus cotinus, L., Smoke tree.
—— typhina, L., Staghorn sumac.
Rhus glabra, L., Smooth sumach.
Ribes rubrum, L., Currant.
—— grossularia, Gooseberry.
Robinia pseud-acacia, L., Common locust.
Rosa centifolia, L., Hundred leaved or cabbagge rose.
—— Carolina, L., Swamp rose.
Rubus odoratus, L., Purple flowered raspberry.
Sagittaria sagittifolia, L., Arrow weed.
Sambucus canadensis, L., Common elder.
—— nigra, L.
Sanguinaria canadensis, L. Blood root.
Saponaria officinale, L., Soapwort, bouncing bet.
Sarracenia purpurea, L., Side-saddle flower.
Saxifragra virginiensis, Michx., Early saxifrage.
Sassafras officinale, Nees., Sassafras.
Silene pennsylvanica, Michx., Wild pink.

Smilacina bifolia, Ker., 2 leaved Solomon seal.
Staphylea trifolia, L., American bladder nut.
Syringa vulgaris, L., Lilac.
Symplocarpus fœtidus, Salisb., Skunk cabbage.
Tilia americana, L., Bass wood, white wood, American lime, or linden.
Tradescantia virginica, L., Spider-wort.
Ulmus americana, L., American elm.
Verbena hastata, L., Blue vervain.
Viburnum opulus, L., Snowball bush.
—— opulifolium, Mx., Nine bark.
Viola lanceolata, L., Lance leaved violet.
—— cucullea, Ait., Hood leaved violet.
Vitis æstivalis, Mich., Summer grape.

First appearance of the following animals, and if possible, time of depositing eggs.

Pandion carolinus, Gm., Fish hawk.
Hirundo purpurea, L., Martin.
Turdus migratorius, L., Robin.
Sialia Wilsonii, Sw., Blue bird.
Agelaius phœniceus, L., Red wing black-bird, and any other species of birds.
Salmo salar, L., Salmon
Alosa, Shad.
Acipenser, Sturgeon.
Cry of toads and frogs.
—— Catydid.
—— Locust. (Cicada.
Appearance of fire-flies.

Albany and Rensselaer Horticultural Society.—The annual show of fruits on the 10th and 11th of September, was one of the best exhibitions of the Society. The display of flowers was also large and respectable, but was less full and perfect in some departments than it would have been, if there had been a sufficient supply of rain. Plums and pears formed a fine show—the former being very extensive, and comprising most of the choice varieties for which this vicinity is justly celebrated. The principal exhibitors of this fruit were Messrs. Dorr, Denniston, and Prentice. Mr. Denniston exhibited several new seedlings of evident merit, for one of which, called Dorr's Favorite, a premium was awarded. He also showed a seedling Green Gage, which so closely resembled the parent in every respect as to be pronounced identical. A very large seedling plum was also exhibited by Wm. Hallenbake, of Greenbush, raised by him. It is fully equal in size to the Red Magnum Bonum, and bears a striking general resemblance to that variety, but is much superior to it in quality, being nearly equal to the best of the dark colored varieties. It received a premium as a seedling. A specimen of prune, raised from seed, sent from Germany, was exhibited by Mr. C. H. Anthony, of Albany. This fruit is raised in several gardens in this vicinity, and might easily be produced here to any extent.

A large and handsome collection of pears was exhibited by Henry Vail, Esq., of Troy, and collections, embracing several of the most esteemed varieties, were also shown by Messrs. V. P. Douw, B. B. Kirtland, E. M. Alystyne, Greenbush; J. Rathbone, E. Dorr, Jefferson Mayell, John S. Goold, J. D. Chism, Wm. James, Albany.

There was a good show of apples,—the principal exhibitors being Messrs. Prentice and Kirtland.

Few peaches were exhibited, though there were some very fine ones from E. Wood, Watervliet, Dr. A. March, and J. Rathbone, Albany.

Grapes, comprising some very excellent specimens, both from houses and open air, were shown. Of the former, those offered by Mr. Henry Vail, attracted much attention. They comprised specimens of the Black Hamburgh and White Frontignac, each bunch of which as we were informed by Mr. Quinn, the gardener, weighed upwards of a pound. They were certainly highly creditable to the skill of the cultivator. The specimens shown by Mr. J. Rathbone were also fine. Isabella and Black Cluster, from open gardens, in fine perfection, were shown by Messrs. E. H. Pease, Jos. Cary, V. P. Douw, and W. W. Frothingham.

There was a good show of melons of the best quality, by Messrs. Dorr, Menand, Prentice, Kirtland, Goold, Mayell, and others.

Vegetables made a large array, and the specimens were generally of excellent quality. Among the collections we noticed those of Messrs. Prentice, Goold, Mayell and Newcomb.

Flowers, comprising dahlias, roses, verbenas, asters, &c., as well as many green-house plants, made a fine appearance, and the collections of Messrs. Menand, Wilson, Douw, Rathbone, D. T. Vail, Newcomb, Goold, and others, attracted much attention and praise.

New-York State Fair.—Floral Hall consisted of an elliptical tent 80 feet wide and 140 feet long. Its interior arrangements were designed in excellent taste. Next to its outer circumference, and extending round the whole tent, was a series of terraced shelves, for the exhibition of fruit. These shelves were very

closely filled. Next to this was the broad passage for the spectators. Inside of this passage was the series of tables, parallel to the fruit tables, for the flowers. These presented a very rich display. The interior area was occupied with a large mass of rockwork in the centre, interspersed with ferns, cactuses, &c., surmounted with a massive rustic tree, supporting baskets of fruits, flowers, grapevines, &c. On each side of the rockwork were high terraces of shelves densely filled with a rich display of greenhouse plants from several contributors.

Among the fruits which excited most attention, were the fine exhibition of peaches—many specimens of Crawford's Early measuring from 10 to 11 inches in circumference. Bartlett and Stevens' Genesee pears were exhibited possessing great beauty; and there was a profusion of fine apples. The following were among the principal contributors:—

W. R. Smith, of Macedon, N. Y., exhibited a collection of large glass jars, containing cherries, strawberries, peaches, &c., beautifully preserved in a fresh state, sealed air-tight. Bissell and Hooker of Rochester, very fine bunches of Black Hamburgh, Golden Chasselas and other exotic grapes, grown in a cold house; several other collections of foreign grapes grown in a similar way, including Muscat of Alexandria, Royal Muscadine, Hamburgh, &c., show the progress of the culture of these varieties. Among the principal contributors, who all furnished extensive collections of fruits, were Benjamin Hodge, of Buffalo; Thorp, Smith & Co., of Syracuse; J. J. Thomas, of Macedon; W. F. and E. Smith, Geneva; and from Ellwanger & Barry, C. J. Ryan, Bissell & Hooker, N. Hayward, S. Moulson, and others of Rochester and vicinity. John Morse of Cayuga Bridge, exhibited 43 sorts of pears, in which we observed very fine specimens of Beurre Bosc, Flemish Beauty, and Pratt. Ellwanger & Barry had more than a hundred sorts of pears, embracing some fine and rare sorts. One of the best collections of plums was from E. Dorr, of Albany.

Among the floral contributions, we observed extensive collections from Wm. Webb and B. Hodge, of Buffalo, John Donnellan and C. Powis, of Greece, and King and Dawe, Ellwanger & Barry, A. Frost & Co., S. Moulson, Wm. Webster, and C. J. Ryan, of Rochester. A beautifully constructed floral alcove was presented by A. Frost & Co.; a large and beautiful box of flowers, of some 200 sorts, by Mary Devoe, of Aurora, Cayuga county; and a very striking and singular conceit,—a finely proportioned pony, five feet long, surmounted by an equestrian "bloom-er," the whole composed of flowers quite tastefully arranged, was exhibited by L. E. Smith, of Saratoga county, New-York.—*Cultivator.*

English and Scotch Acres.—The English acre contains 4,840 square yards—the Scotch, 6,150. The Scotch acre, therefore, is rather more than one-fourth the largest.

Answers to Correspondents.

Cheap Cottages.—*A Massachusetts Subscriber.* You will find the ground plans with descriptions, of the cheap cottages you refer to, in our work on "Country Houses," pages 73 and 95. The first part of this work, on Cottages and Farm Houses, may be had separate at $2—or the whole, including Villas and Furniture, for $4. It is published by Appleton & Co., New-York, and may be ordered through any country bookseller.

Grapes.—*C. P. Williams,* (Albany.) The leaf blight which turns brown the edges of the native grape, has not been satisfactorily explained. Picking off the leaves affected appears to prevent its spreading. *B. Johnson.*—The Clinton Grape is worthy of trial as a wine grape. It is much earlier and hardier than the Isabella. Norton's Seedling has borne with us for several years past, and we have rejected it as worthless for the table. The Elsinburgh is the best of all the small native sorts—being delicate in flavor, sweet, and entirely without hard pulp. *W. B. P.*, (Buffalo.) You have allowed your vine to extend too much, and exhaust itself. Dig in this fall, about the roots, over an area of some 15 or 20 feet square, as much stable, or other strong animal manure as will cover the surface of the ground. Next spring apply half a peck of plaster as a top dressing. This will effectually renovate the vine.

Select Lists of Fruits.—*An Amateur,* (Pittsburgh.) The following are very fine new pears, whose excellence has been proved in the northern states. Bonne des Lees—August—melting, very juicy; Beurre Langlier—December—melting, vinous flavor; Suzette de Bavay—Jan. Feb.—sweet, sprightly; Brandywine—Sept—sweet, very juicy; Alpha—Oct.—buttery, fine. Of the standard pears we recommend to you the following for a small collection, viz: *Early pears*—Bartlett, Dearbon's Seedling, Tyson, Rostiezer. *Autumn pears*—Beurre d'Anjou,

Fondante d'Automne, Duchess d'Angouleme, Doyenne Boussock, Heathcote, Louise Bonne de Jersey. *Winter pears*—Beurre d'Arembergh, Lawrence, Winter Nelis. For three plums, we would plant Green Gage, Purple Favorite, Imperial Gage; three cherries—May Duke, Black Tartarian, Downer's Late. The Breda is the hardiest apricot of first rate quality.

Keeping Grapes.—*W. S.*, (New-York.) If you wish to preserve your grapes very perfectly, take large earthern jars and fill the bottom one inch in depth with dry charcoal dust. Pick the clusters in a dry cool day—dip the end of the stalk in melted sealing wax; cut out every decayed or wilted berry with a small scissors. Wrap each bunch in soft paper, and lay one upon another till the jar is full. Then put the lid of the jar on, and cover it all round the edges with pulverised charcoal. Set the jars away on shelves in a cool dry cellar, or room where the temperature is low without frost.

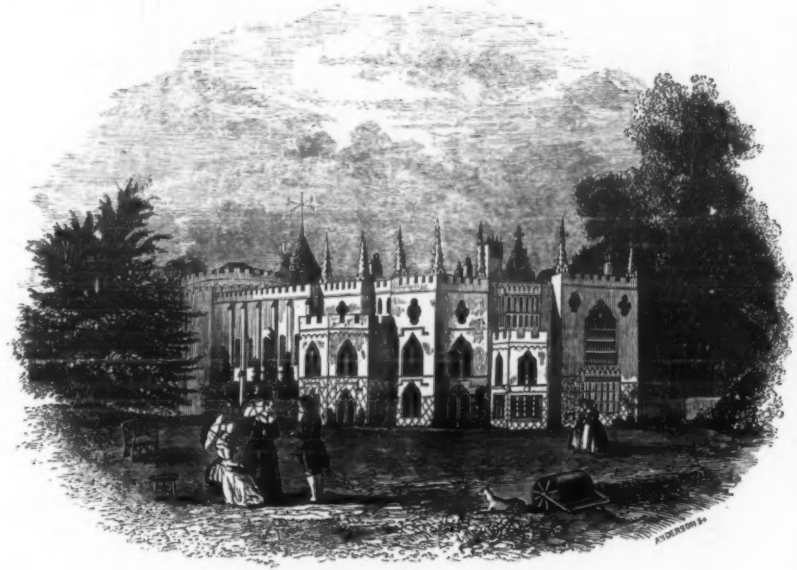
Taking up Green-house Plants.—*A Lady in Ohio.* First remove all the earth very carefully, by slicing it gradually away with the spade, so as to leave an unbroken ball, containing the roots, about the size of the pot or tub into which you wish to remove the plant. Then soak this ball of earth very plentifully with water, so that it is quite saturated. Leave it all night to drain off. In the morning you will find the ball to adhere well to the roots, and you can then lift it and pot it with little or no check to the plant. For forty-eight hours after removal it is best to place the transplanted exotics in a close frame or cellar—where the air is damp.

Tomatoes. — *William*, (New-Bedford.) If you pull up the tomato plants before the frost has touched them, and hang them up in a dry light seed room, or garret, the fruit will continue to ripen for several weeks.

Evergreens. — *R. Van W.*, (Oneida Co.) You may transplant evergreens successfully at any season, if you take balls of earth with them. Otherwise, they grow most readily when the buds have just started in the spring. The white pine is the best for your purpose—it transplants easily, grows fast, and holds its color all seasons. The English Yew is a little tender north of New-York. We are not confident that the Chili Pine will prove entirely hardy with you—but the Deodar will, and is a most graceful tree. There is no more ornamental hardy evergreen for general purposes, than the Norway Spruce.

Clean Trees for Streets.—*A Philadelphian.* There are no better or cleaner trees for streets, than the Silver Maple, Sugar Maple and Tulip tree—not one of which, so far as we have observed, are infested with insects. Lindens and Elms are always hazardous in this respect.

Preparing Fruit Gardens.—*R.*, (Hartford, Ct.) First give the soil a heavy dressing of stable manure and ashes—then trench it two spades deep. Plant your trees in good composted soil, and mulch them with three inches of tan-bark—after the ground has settled over the roots. In your light soil we would never stir or dig the ground at all, over the roots of fruit trees. But every other autumn we would remove the mulching—give a top-dressing of decomposed manure and ashes, and replace the tan again upon the top—keeping it there summer and winter—by renewing it as often as necessary. Nothing is so injurious to fruit trees in light soils, as to be constantly stirring the soil, and breaking the young fibres.



STRAWBERRY HILL.—(See page 510.)